

=> file reg
FILE 'REGISTRY' ENTERED AT 15:30:43 ON 16 OCT 2002
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=> d his
FILE 'REGISTRY' ENTERED AT 15:14:26 ON 16 OCT 2002
L1 66 SEA (NI(L)GD)/ELS (L) 2/ELC.SUB
E NICKEL/CN
L2 1 SEA NICKEL/CN
E GADOLINIUM/CN
L3 1 SEA GADOLINIUM/CN

FILE 'HCA' ENTERED AT 15:15:53 ON 16 OCT 2002
L4 QUE 70/SC,SX OR 71/SC,SX
L5 90387 SEA (ATOMIC? OR NUCLEAR? OR RADIOACTIV?) (2A) (FUEL? OR
STORE# OR STORING# OR STORAG? OR SHIELD? OR CLAD? OR
CASING# OR ENCAS? OR ENCLOS? OR ENVELOP? OR HOUSING# OR
SHROUD? OR JACKET? OR ENWRAP? OR WRAP? OR GUARD? OR
SCREEN?)
L6 332503 SEA CANNISTER? OR CONTAINER? OR VESSEL? OR RECEPTACL? OR
DRUM OR DRUMS OR BARREL?
L7 940 SEA (NICKEL# OR NI) (2A) (GADOLINIUM# OR GD)
L8 350 SEA L1
L9 248262 SEA L2
L10 21615 SEA L3
L11 0 SEA L8 AND L5
L12 21 SEA L8 AND L4
L13 1 SEA L12 AND L6
L14 38 SEA L5 AND L9 AND L10
L15 24 SEA L14 AND L4
L16 0 SEA L14 AND L6
L17 1 SEA L14 AND L7
L18 3 SEA L7 AND L5
L19 4 SEA L7 AND L6
L20 42 SEA L7 AND L4
L21 7 SEA L13 OR L17 OR L18 OR L19
L22 43 SEA (L12 OR L15) NOT L21
L23 44 SEA (L14 OR L20) NOT (L21 OR L22)
D COST

FILE 'REGISTRY' ENTERED AT 15:30:43 ON 16 OCT 2002

=> file hca
FILE 'HCA' ENTERED AT 15:31:03 ON 16 OCT 2002
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=> d 121 1-7 cbib abs hitstr hitind

L21 ANSWER 1 OF 7 HCA COPYRIGHT 2002 ACS
133:273131 Advanced neutron absorbers for spent fuel applications.
Smolik, Galen R.; Branagan, D. J.; Shaber, Eric L. (Idaho National
Engineering and Environmental Laboratory, Idaho Falls, ID,
83415-2218, USA). Global '99: "Nuclear Technology - Bridging the
Millennia", Proceedings of the International Conference on Future
Nuclear Systems, Jackson Hole, WY, United States, Aug. 29-Sept. 3,

1999, 775-782. American Nuclear Society: La Grange Park, Ill.
(English) 1999. CODEN: 69AGIT.

AB Neutron absorbers will play an important role in the long-term storage of certain types of enriched spent ***nuclear*** ***fuels***. High n absorbing capability, long-term stability, and the capacity to stay with the fuel are important criteria in preventing crit. conditions during possible waste package degrdn. in geol. time frames. Gd contained within a relatively insol. compd. or alloy is attractive from both a cost and a n absorbing standpoint. This paper addresses studies involving the inclusion of Gd in several alloy systems which have been processed to yield amorphous, nanocryst., or microcryst. microstructures which provide good homogeneity and corrosion resistance.

CC 71-5 (Nuclear Technology)

Section cross-reference(s): 55, 56

IT Spent ***nuclear*** ***fuel***

(advanced neutron absorbers for spent fuel applications)

IT 162395-46-2, Boron 19.8, gadolinium 1, iron 79.2 (atomic)
237081-61-7, Boron 18.4, gadolinium 8, iron 73.6 (atomic)
237081-62-8, Chromium 24.4, gadolinium 1, iron 3.27, molybdenum 8.12, nickel 62.4, tungsten 0.69, vanadium 0.2 (atomic)
237081-63-9, Chromium 22.6, gadolinium 8, iron 3.04, molybdenum 7.54, nickel 58, tungsten 0.64, vanadium 0.18 (atomic)
237081-64-0, Boron 19.8, chromium 15.8, gadolinium 1, iron 63.4 (atomic) 237081-65-1, Boron 18.4, chromium 14.7, gadolinium 8, iron 58.9 (atomic) 237081-68-4, Copper 29.7, ***gadolinium*** 1, ***nickel*** 69.3 (atomic) 237081-69-5, Copper 27.6, ***gadolinium*** 8, ***nickel*** 64.4 (atomic)
(advanced neutron absorbers for spent fuel applications)

L21 ANSWER 2 OF 7 HCA COPYRIGHT 2002 ACS

126:38522 Separation of gadolinium isotope. Adachi, Hajime; Kuwako, Akira; Araki, Yoshio (Tokyo Shibaura Electric Co, Japan). Jpn. Kokai Tokkyo Koho JP 08276117 A2 19961022 Heisei, 11 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-79253 19950405.

AB A ***Gd*** - ***Ni*** alloy is heated in a crucible and vaporized, the metal vapor is irradiated with a multi-wavelength laser to excite a specific Gd isotope and ionizes it, an elec. field is applied to it, the ions which were formed from the ionization and a portion of neutral atoms are recovered in a heated recovering ***vessel***, the thus obtained enriched ***Gd*** - ***Ni*** alloy is recovered in liq. form, followed by chem. sepn. to obtain enriched Gd as a product. The Gd in the ***Gd*** - ***Ni*** alloy can be replaced by In, Mg, Mn, Pd or Tl. The recovery of the product and waste is easy and the prodn. of Gd isotope such as Gd-157 can be carried out economically.

IT ***58205-10-0***

(sepn. of gadolinium isotopes by using nickel alloy)

RN 58205-10-0 HCA

CN Gadolinium alloy, nonbase, Gd,Ni (9CI) (CA INDEX NAME)

Component	Component
	Registry Number
Gd	7440-54-2
Ni	7440-02-0

=====+=====

Gd 7440-54-2

Ni 7440-02-0

IT ***184846-64-8***

(sepn. of isotopes by using nickel alloy)

RN 184846-64-8 HCA

CN Gadolinium alloy, base, Gd 60-85, Ni 15-40 (9CI) (CA INDEX NAME)

Component	Component	Component		
Percent		Registry Number		
Gd	60	-	85	7440-54-2
Ni	15	-	40	7440-02-0

IC ICM B01D059-34

CC ***71-6*** (Nuclear Technology)

ST gadolinium isotope sepn laser irradn; ***nickel***

gadolinium alloy vaporization

IT ***58205-10-0***

(sepn. of gadolinium isotopes by using nickel alloy)

IT ***184846-64-8*** 184846-65-9 184846-66-0 184846-67-1
184846-68-2

(sepn. of isotopes by using nickel alloy)

L21 ANSWER 3 OF 7 HCA COPYRIGHT 2002 ACS

109:29491 ***Nickel*** -like ***gadolinium*** spectra from the PLT tokamak. Von Goeler, S.; Beiersdorfer, P.; Bitter, M.; Bell, R.; Hill, K.; LaSalle, P.; Ratzan, L.; Stevens, J.; Timberlake, J.; et al. (Plasma Phys. Lab., Princeton Univ., Princeton, NJ, 08544, USA). J. Phys., Colloq., C1(IAU Colloq. No. 102 UV X-ray Spectrosc. Astrophys. Lab. Plasmas, 1988), C1-181/C1-184 (English) 1988.

CODEN: JPQCAK. ISSN: 0449-1947.

AB X-ray spectra at 7-9 .ANG. of Gd were measured on the PLT tokamak with a vacuum curved crystal spectrometer. The wavelengths were compared with theor. predictions from the RAC code for Fe, Co, Ni, Cu, and Zn-charge states.

CC 73-6 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 71

IT ***Nuclear*** fusion reactor ***fuels*** and plasmas (tokamak, x-ray emission by gadolinium cations in)

L21 ANSWER 4 OF 7 HCA COPYRIGHT 2002 ACS

88:127688 Self-consistent screening of a positive muon in a spin-polarized electron gas. Jena, P.; Singwi, K. S.; Nieminen, R. M. (Mater. Res. Cent., Northwestern Univ., Evanston, Ill., USA). Phys. Rev. B, 17(1), 301-7 (English) 1978. CODEN: PLRBAQ. ISSN: 0556-2805.

AB The e- spin-d. distribution around a .mu.+ was calcd. self-consistently for a range of metallic densities by using the spin-d. functional formalism. The enhancement of the spin d. at the .mu.+ site over the ambient polarization is considerably smaller than the corresponding charge-d. enhancement. The results were used to est. the hyperfine field at interstitial .mu.+ sites in ferromagnetic Fe, Co, ***Ni***, and ***Gd***. Comparisons were made with the most-recent exptl. data.

IT ***7440-02-0***, properties ***7440-54-2***, properties (magnetic hyperfine field at interstitial pos. muon sites in)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 70-6 (Nuclear Phenomena)
Section cross-reference(s): 77
IT ***Screening*** , electronic and ***nuclear***
(of muon (.mu.+), in spin-polarized electron gas,
self-consistent)
IT 7439-89-6, properties ***7440-02-0*** , properties 7440-48-4,
properties ***7440-54-2*** , properties
(magnetic hyperfine field at interstitial pos. muon sites in)

L21 ANSWER 5 OF 7 HCA COPYRIGHT 2002 ACS

72:139116 Family of compounds of the type La₆Mn₂Al₂S₁₄. Collin, Gaston;
Flahaut, Jean (Lab. Chim. Miner., Fac. Pharm., Paris, Fr.). C. R.
Acad. Sci., Ser. C, 270(5), 488-90 (French) 1970. CODEN: CHDCAQ.
AB L6M₂Al₂S₁₄ (L = rare earth element La to Dy or Y; M = Mg, Mn, Fe,
Co, Ni) were prep'd. by heating mixts. of L₂S₃ and elemental Al and M
(or MS) at 900.degree. under H₂S in graphite ***containers***
L6M₂Al₂S₁₄ (M = Ti, V, Cr, Zn, Cd) were prep'd. by heating mixts. of
L6Al₂S₁₂ (preheated under H₂S) and MS in silica capsules. X-ray
diffraction studies indicated hexagonal symmetry, space group p6₃,
type Ce₆Al₁₀/3S₁₄, with Al at tetrahedral sites and M at octahedral
sites. The lattice parameter a decreases regularly from L = La to L
= Dy, is max. for M = Cd, and is min. for M = Ni. The parameter c
is approx. independent of M, increases from L = La to L = Gd, then
remains const.

CC 78 (Inorganic Chemicals and Reactions)
IT Aluminum cadmium cerium sulfide (CdAlCe₃S₇)
Aluminum cadmium lanthanum sulfide (CdAlLa₃S₇)
Aluminum cerium chromium sulfide (CrAlCe₃S₇)
Aluminum cerium cobalt sulfide (CoAlCe₃S₇)
Aluminum cerium iron sulfide (FeAlCe₃S₇)
Aluminum cerium magnesium sulfide (MgAlCe₃S₇)
Aluminum cerium manganese sulfide (MnAlCe₃S₇)
Aluminum cerium nickel sulfide (NiAlCe₃S₇)
Aluminum cerium titanium sulfide (TiAlCe₃S₇)
Aluminum cerium zinc sulfide (ZnAlCe₃S₇)
Aluminum chromium gadolinium sulfide (CrAlGd₃S₇)
Aluminum chromium lanthanum sulfide (CrAlLa₃S₇)
Aluminum cobalt dysprosium sulfide (CoAlDy₃S₇)
Aluminum cobalt gadolinium sulfide (CoAlGd₃S₇)
Aluminum cobalt lanthanum sulfide (CoAlLa₃S₇)
Aluminum cobalt neodymium sulfide (CoAlNd₃S₇)
Aluminum cobalt praseodymium sulfide (CoAlPr₃S₇)
Aluminum cobalt samarium sulfide (CoAlSm₃S₇)
Aluminum cobalt yttrium sulfide (CoAlY₃S₇)
Aluminum dysprosium iron sulfide (FeAlDy₃S₇)
Aluminum dysprosium manganese sulfide (MnAlDy₃S₇)
Aluminum dysprosium nickel sulfide (NiAlDy₃S₇)
Aluminum gadolinium iron sulfide (FeAlGd₃S₇)
Aluminum gadolinium magnesium sulfide (MgAlGd₃S₇)
Aluminum gadolinium manganese sulfide (MnAlGd₃S₇)
Aluminum ***gadolinium*** ***nickel*** sulfide (NiAlGd₃S₇)
Aluminum gadolinium titanium sulfide (TiAlGd₃S₇)
Aluminum gadolinium vanadium sulfide (VAlGd₃S₇)
Aluminum gadolinium zinc sulfide (ZnAlGd₃S₇)
Aluminum iron lanthanum sulfide (FeAlLa₃S₇)
Aluminum iron neodymium sulfide (FeAlNd₃S₇)
Aluminum iron praseodymium sulfide (FeAlPr₃S₇)
Aluminum iron samarium sulfide (FeAlSm₃S₇)

Aluminum iron terbium sulfide (FeAlTb₃S₇)
Aluminum iron yttrium sulfide (FeAlY₃S₇)
Aluminum lanthanum magnesium sulfide (MgAlLa₃S₇)
Aluminum lanthanum manganese sulfide (MnAlLa₃S₇)
Aluminum lanthanum nickel sulfide (NaAlLa₃S₇)
Aluminum lanthanum titanium sulfide (TiAlLa₃S₇)
Aluminum lanthanum vanadium sulfide (VAlLa₃S₇)
Aluminum lanthanum zinc sulfide (ZnAlLa₃S₇)
Aluminum manganese neodymium sulfide (MnAlNd₃S₇)
Aluminum manganese praseodymium sulfide (MnAlPr₃S₇)
Aluminum manganese samarium sulfide (MnAlSm₃S₇)
Aluminum manganese yttrium sulfide (MnAlY₃S₇)
Aluminum neodymium nickel sulfide (NiAlNd₃S₇)
Aluminum nickel praseodymium sulfide (NiAlPr₃S₇)
Aluminum nickel samarium sulfide (NiAlSm₃S₇)
Aluminum nickel yttrium sulfide (NiAlY₃S₇)
(crystal structure of)

L21 ANSWER 6 OF 7 HCA COPYRIGHT 2002 ACS

72:69920 Calculation of vacuum arc melting of alloys with high vapor pressure. Tkachev, S. D. (USSR). Izv. Akad. Nauk SSSR, Metal. (5), 74-9 (Russian) 1969. CODEN: IZNMAQ.

AB Conditions for the d.c. and a.c. arc melting of metals and alloys with high vapor pressures or contg. readily vaporizable addns., can be calcd. from a series of equations developed to yield crit. operating parameters such as arc currents (I_{cr}), magnetic field intensities (H_{cr}), and pressures (P_{cr}). The equations apply directly to d.c. operations but do not hold for ferromagnetic (Fe, ***Ni***, Co, ***Gd***) metals because their vapors can form a magnetic field. Arc melting in a vacuum is successful when ionization of the vaporized metal is prevented; this occurs at operations above I_{cr}, or at <I_{cr} but at a superimposed magnetic field >H_{cr} and at pressures >P_{cr}. Conditions for a.c. operations can be calcd. by correcting for eddy turbulences caused by the alternating elec. field. Successful a.c. meltings were conducted by operating at resonance through the addn. of a compensating capacitor to the solenoid (inductor). Dense Cr (vacuum) melts were prep'd. by using d.c. and a.c. (50, 480, and 2500 Hz) currents of 200 A, arc voltages 22-5 V, metal vapor pressures of 10⁻³ torr. The H_{cr} = 65.6 times 10³ A/m for a 0.07-m diam. mold, 0.04-m diam. electrode, and an electrode-to- ***vessel*** voltage drop of 0.9 V.

CC 56 (Nonferrous Metals and Alloys)

L21 ANSWER 7 OF 7 HCA COPYRIGHT 2002 ACS

69:56704 High-current impulse argon arc method for the spectrographic analysis of microsamples. Svoboda, Vratislav; Kleinmann, Imrich (Inst. Res., Prod., Use Radioisotopes, Prague, Czech.). Anal. Chem., 40(10), 1534-40 (English) 1968. CODEN: ANCHAM.

AB A spectrographic technique employing the wall-stabilized, short-lasting, high-current (60-amp.) Ar arc for excitation is described. Wt. of samples should not exceed 400 .mu.g. The contamination by the radioactive sample is eliminated, since the excitation is performed in a closed ***vessel***. The limit of detection for Sr in the more sensitive variant of anal. is 0.0005 ng.; in the less sensitive one, 0.003 ng. Other limits of detection are: for Ag, Be, Cu, Ti, Y, and Yb, 0.01-0.09 ng., for Eu, Mn, Sc, Tm, and Zr, 0.1-0.4 ng., for Ba, Dy, Er, Na, Mo, La, Ho, Pd, Tb, and Zn, 0.5-1 ng.; for Co, Bi, ***Gd***, Fe, ***Ni***, Cd, Lu, In, Cr, Rh, Th, and V, 1-3 ng.; for Au, B, Nd, Pb, Pr, Pt, Sb, Sm,

Sn, and Tl, 4-10 ng.; for W and As, 10-40 ng.; and for Te, 60 ng. A 2-m. spectrograph with 325-groove/mm. grating and blaze angle 19.degree. is used, so that at one exposure a broad spectral region (2000-5400 Å.) with reciprocal dispersion from 1.5 to 3.5 Å./mm. is covered. For arc sources burning in Ar and O atm. at discharge currents of 10-90 amp., the high-current arc sources ensure low limits of detection and lower matrix effects than low-current arcs. In an Ar atm., the line intensity is .apprx.2-fold for most elements in comparison with that of O.

CC 79 (Inorganic Analytical Chemistry)

=> d 122 1-43 ti

L22 ANSWER 1 OF 43 HCA COPYRIGHT 2002 ACS
TI Encapsulation of waste

L22 ANSWER 2 OF 43 HCA COPYRIGHT 2002 ACS
TI Encapsulation of waste

L22 ANSWER 3 OF 43 HCA COPYRIGHT 2002 ACS
TI A study on electrorefining of uranium metal in fluoride/chloride molten salt

L22 ANSWER 4 OF 43 HCA COPYRIGHT 2002 ACS
TI Investigation of the magnetic hyperfine field of ^{111}Cd in the rare-earth Laves phases RCo_2 and RNi_2

L22 ANSWER 5 OF 43 HCA COPYRIGHT 2002 ACS
TI Fuel element for water-moderated power reactors

L22 ANSWER 6 OF 43 HCA COPYRIGHT 2002 ACS
TI Chemical analysis of matrix-graphite in spherical fuel elements

L22 ANSWER 7 OF 43 HCA COPYRIGHT 2002 ACS
TI Extraction of uranium(VI) in nitric acid solution with supercritical carbon dioxide fluid containing tributylphosphate

L22 ANSWER 8 OF 43 HCA COPYRIGHT 2002 ACS
TI Use of a direct current glow discharge mass spectrometer for the chemical characterization of samples of nuclear concern

L22 ANSWER 9 OF 43 HCA COPYRIGHT 2002 ACS
TI Trace metal assay of uranium silicide fuel

L22 ANSWER 10 OF 43 HCA COPYRIGHT 2002 ACS
TI Microparticle coating on inside of fuel rods and other fuel assembly components

L22 ANSWER 11 OF 43 HCA COPYRIGHT 2002 ACS
TI Study of isotachophoretic separation behavior of metal cations by means of particle-induced X-ray emission. VI. Selective separation of twenty metal cations using tartaric acid as a complexing agent

L22 ANSWER 12 OF 43 HCA COPYRIGHT 2002 ACS
TI Study of isotachophoretic separation behavior of metal cations by means of particle-induced x-ray emission. V. Fractionation of platinum group elements from a model solution of ***nuclear*** ***fuel*** waste by means of continuous free-flow isotachophoresis

L22 ANSWER 13 OF 43 HCA COPYRIGHT 2002 ACS
TI Use of total reflection x-ray fluorescence spectrometry in the analysis of nuclear reprocessing samples

L22 ANSWER 14 OF 43 HCA COPYRIGHT 2002 ACS
TI Trace metal characterization of the uranium-aluminum matrix by atomic spectroscopy

L22 ANSWER 15 OF 43 HCA COPYRIGHT 2002 ACS
TI Core debris chemistry and fission product behavior

L22 ANSWER 16 OF 43 HCA COPYRIGHT 2002 ACS
TI Location of a unique site for tantalum-181 nuclei in rare earth-nickel (RNi5) compounds by TDPAC technique

L22 ANSWER 17 OF 43 HCA COPYRIGHT 2002 ACS
TI Direct quantitative determination, using flameless atomic absorption spectroscopy, of metallic impurities and rare earths in nuclear solutions containing uranium, thorium, and fission products

L22 ANSWER 18 OF 43 HCA COPYRIGHT 2002 ACS
TI Spark source mass spectrographical specification of mixed oxide reactor fuel for metallic and rare earth impurities

L22 ANSWER 19 OF 43 HCA COPYRIGHT 2002 ACS
TI Direct quantitative determination of metallic and rare earth impurities in nuclear solutions containing uranium, thorium, and fission products by flameless atomic absorption spectroscopy

L22 ANSWER 20 OF 43 HCA COPYRIGHT 2002 ACS
TI ADL1 - an atomic data library for use in computing the behavior of plasma devices including fusion reactors

L22 ANSWER 21 OF 43 HCA COPYRIGHT 2002 ACS
TI Study of the quadrupole interaction of cadmium-111 in RNi5 compounds [R = rare earth metal]

L22 ANSWER 22 OF 43 HCA COPYRIGHT 2002 ACS
TI The spectrographic analysis of plutonium oxide or mixed plutonium oxide/uranium oxide fuel pellets by the dried residue technique

L22 ANSWER 23 OF 43 HCA COPYRIGHT 2002 ACS
TI Pair production by photons screening corrections for intermediate and high energies

L22 ANSWER 24 OF 43 HCA COPYRIGHT 2002 ACS
TI Spectrochemical procedures for analytical control of eighteen general impurities and fourteen rare earth elements in uranium dioxide pellets and other uranium-base materials

L22 ANSWER 25 OF 43 HCA COPYRIGHT 2002 ACS
TI Pair production by photons. Screening corrections for intermediate and high energies

L22 ANSWER 26 OF 43 HCA COPYRIGHT 2002 ACS
TI Moessbauer effect in some intermetallic gadolinium compounds

L22 ANSWER 27 OF 43 HCA COPYRIGHT 2002 ACS
TI Spectrochemical determination of trace impurities in uranium oxide by carrier distillation method using the d.c. arc cathode-central

region

L22 ANSWER 28 OF 43 HCA COPYRIGHT 2002 ACS
TI Crystalline structure, magnetic and magnetoelastic properties of films of GdM₂ compounds (M=Cr, Mn, Fe, Co, Ni, Cu, Zn) of laves phase type

L22 ANSWER 29 OF 43 HCA COPYRIGHT 2002 ACS
TI Transport properties of ferromagnetic systems near the critical point. Electrical resistivity

L22 ANSWER 30 OF 43 HCA COPYRIGHT 2002 ACS
TI Galvanomagnetic properties and phase composition of nickel-gadolinium films

L22 ANSWER 31 OF 43 HCA COPYRIGHT 2002 ACS
TI Heat capacity studies of intermetallic compounds containing rare earth elements

L22 ANSWER 32 OF 43 HCA COPYRIGHT 2002 ACS
TI Heat capacity and electrical resistivity of some lanthanide-nickel (LnNi₅) compounds between 5 and 300.deg.K

L22 ANSWER 33 OF 43 HCA COPYRIGHT 2002 ACS
TI Thermopower anomaly in GdNi₂. Spin scattering model versus static entropy model

L22 ANSWER 34 OF 43 HCA COPYRIGHT 2002 ACS
TI Crystallographic, magnetic, and EPR studies of rare-earth yttrium-nickel Laves phases

L22 ANSWER 35 OF 43 HCA COPYRIGHT 2002 ACS
TI Thermal variation of the parameters of some Laves phases TM₂ [consisting of yttrium and the rare-earths with cobalt and nickel]

L22 ANSWER 36 OF 43 HCA COPYRIGHT 2002 ACS
TI Electrical resistance near ferromagnetic Curie points

L22 ANSWER 37 OF 43 HCA COPYRIGHT 2002 ACS
TI Crystal structuree of rare-earth nickel compounds of the type R₂Ni₇

L22 ANSWER 38 OF 43 HCA COPYRIGHT 2002 ACS
TI Ternary compounds of the NaZn₁₃ type and related types in the {La, Ce, Pr, Nd, Sm, Eu, Gd}-Ni-Si and {La, Ce, }-{Fe, Co}-Si systems

L22 ANSWER 39 OF 43 HCA COPYRIGHT 2002 ACS
TI Effect of the molecular field on the electrical resistivity near a magnetic transition: GdNi₂

L22 ANSWER 40 OF 43 HCA COPYRIGHT 2002 ACS
TI Crystal structures of AB₃ and A₂B₇ rare earth-nickel phases

L22 ANSWER 41 OF 43 HCA COPYRIGHT 2002 ACS
TI Crystal structures of intermetallic compounds of nickel with the rare-earth metals or yttrium

L22 ANSWER 42 OF 43 HCA COPYRIGHT 2002 ACS
TI Crystallographic structure of rare earth intermetallic compounds of the type T₃Ni, where T is a rare earth or yttrium atom

L22 ANSWER 43 OF 43 HCA COPYRIGHT 2002 ACS
TI Crystallographic and magnetic properties of alloys with the formula TNi₃, where T is yttrium or a rare earth metal

=> d 123 1-44 ti

L23 ANSWER 1 OF 44 HCA COPYRIGHT 2002 ACS
TI Production of selected cosmogenic radionuclides by muons 1. Fast muons

L23 ANSWER 2 OF 44 HCA COPYRIGHT 2002 ACS
TI Neutron collimator with rectangular beam profile

L23 ANSWER 3 OF 44 HCA COPYRIGHT 2002 ACS
TI A neutron polarizer

L23 ANSWER 4 OF 44 HCA COPYRIGHT 2002 ACS
TI Advanced neutron absorber materials

L23 ANSWER 5 OF 44 HCA COPYRIGHT 2002 ACS
TI New screening coefficients for the hydrogenic ion model including l-splitting for fast calculations of atomic structure in plasmas

L23 ANSWER 6 OF 44 HCA COPYRIGHT 2002 ACS
TI Multiband theory for heavy-ion neutron-pair transfer among deformed Gd nuclei

L23 ANSWER 7 OF 44 HCA COPYRIGHT 2002 ACS
TI Impurity-induced modulations in NbSe₃ detected by atomic-force microscopy

L23 ANSWER 8 OF 44 HCA COPYRIGHT 2002 ACS
TI Electron-electron interaction and antishielding constants of core shells of atoms

L23 ANSWER 9 OF 44 HCA COPYRIGHT 2002 ACS
TI Hyperfine structure calculations for inner atomic levels

L23 ANSWER 10 OF 44 HCA COPYRIGHT 2002 ACS
TI Spectroscopic study of gadolinium-155 and -157

L23 ANSWER 11 OF 44 HCA COPYRIGHT 2002 ACS
TI The g-factor measurements in stable mercury isotopes

L23 ANSWER 12 OF 44 HCA COPYRIGHT 2002 ACS
TI A method for the calculation of Sommerfeld's screening parameters .sigma.1 and .sigma.2 for experimentally unresolved spin doublets

L23 ANSWER 13 OF 44 HCA COPYRIGHT 2002 ACS
TI The Sommerfeld screening parameter .sigma.2 and theoretically calculated energies of atomic inner shells

L23 ANSWER 14 OF 44 HCA COPYRIGHT 2002 ACS
TI Multilayer interference structures (MIS) based on strongly absorbing substances

L23 ANSWER 15 OF 44 HCA COPYRIGHT 2002 ACS
TI Transient K-shell hyperfine fields and deduced polarizations for single-electron carbon and oxygen ions in different ferromagnets

L23 ANSWER 16 OF 44 HCA COPYRIGHT 2002 ACS
TI Analytical Dirac-Hartree-Fock-Slater screening function for atoms (Z = 1-92)

L23 ANSWER 17 OF 44 HCA COPYRIGHT 2002 ACS
TI Multiple scattering of protons and alpha particles by thick foils

L23 ANSWER 18 OF 44 HCA COPYRIGHT 2002 ACS
TI Determination of forty trace impurity elements in uranium compounds by end-on viewed ICP-AES

L23 ANSWER 19 OF 44 HCA COPYRIGHT 2002 ACS
TI The transient magnetic field acting on swift nuclei moving in magnetized solids

L23 ANSWER 20 OF 44 HCA COPYRIGHT 2002 ACS
TI Estimation of the effective charges in metal crystal lattices

L23 ANSWER 21 OF 44 HCA COPYRIGHT 2002 ACS
TI Neutron-optical properties of multilayer systems with absorption

L23 ANSWER 22 OF 44 HCA COPYRIGHT 2002 ACS
TI Identification of new isotopes in reactions with charged particles using a U-150 accelerator

L23 ANSWER 23 OF 44 HCA COPYRIGHT 2002 ACS
TI Light nuclei as distinct probes for transient magnetic fields

L23 ANSWER 24 OF 44 HCA COPYRIGHT 2002 ACS
TI Scaling of the transient magnetic field with the polarization density of the host

L23 ANSWER 25 OF 44 HCA COPYRIGHT 2002 ACS
TI Electron spin resonance study of gadolinium in the nuclear cooling agent: praseodymium pentanickel single crystals

L23 ANSWER 26 OF 44 HCA COPYRIGHT 2002 ACS
TI Stopping power and range of silicon atoms in different materials using DSAM technique

L23 ANSWER 27 OF 44 HCA COPYRIGHT 2002 ACS
TI Sommerfeld screening parameters for the K level in x-ray spectra

L23 ANSWER 28 OF 44 HCA COPYRIGHT 2002 ACS
TI Dilute impurity hyperfine fields. Systematics and comparison with models

L23 ANSWER 29 OF 44 HCA COPYRIGHT 2002 ACS
TI Hyperfine interaction studies of radon in some metals and metal oxides with the alpha-gamma angular correlation method

L23 ANSWER 30 OF 44 HCA COPYRIGHT 2002 ACS
TI Magnetic field around muon(+) in ferromagnets

L23 ANSWER 31 OF 44 HCA COPYRIGHT 2002 ACS
TI Extraction-photometric determination of trace impurities of copper, nickel, and iron in gadolinium and lead molybdates

L23 ANSWER 32 OF 44 HCA COPYRIGHT 2002 ACS

TI Formation conditions for ***gadolinium*** ***nickel*** oxide (Gd₂NiO₄)

L23 ANSWER 33 OF 44 HCA COPYRIGHT 2002 ACS

TI Spin polarization of electrons tunneling from films of iron, cobalt, ***nickel***, and ***gadolinium***

L23 ANSWER 34 OF 44 HCA COPYRIGHT 2002 ACS

TI Spin polarization of tunneling electrons from films of iron, cobalt, ***nickel*** and ***gadolinium***

L23 ANSWER 35 OF 44 HCA COPYRIGHT 2002 ACS

TI Structural stability of the gadolinium-transition metal compounds with Fe₃C structure

L23 ANSWER 36 OF 44 HCA COPYRIGHT 2002 ACS

TI Contribution of two-phonon processes to the anomalous Hall effect

L23 ANSWER 37 OF 44 HCA COPYRIGHT 2002 ACS

TI Electronic structure of disordered alloys

L23 ANSWER 38 OF 44 HCA COPYRIGHT 2002 ACS

TI ***Shielding*** of ***nuclear*** charge of electron shells of the atom according to the Bohr model

L23 ANSWER 39 OF 44 HCA COPYRIGHT 2002 ACS

TI Field emission from ***nickel***, ***gadolinium***, and europium sulfide evaporated onto tungsten

L23 ANSWER 40 OF 44 HCA COPYRIGHT 2002 ACS

TI Screening constants in x-ray spectra

L23 ANSWER 41 OF 44 HCA COPYRIGHT 2002 ACS

TI Proximity effect between superconducting and normal films

L23 ANSWER 42 OF 44 HCA COPYRIGHT 2002 ACS

TI Numerical Hartree-Fock results for the atoms helium to radon

L23 ANSWER 43 OF 44 HCA COPYRIGHT 2002 ACS

TI ***Nuclear*** magnetic ***shielding*** constants calculated from numerical Hartree-Fock wavefunctions

L23 ANSWER 44 OF 44 HCA COPYRIGHT 2002 ACS

TI The effect of pressure on the lattice parameters. Lead sulfide and lead telluride and ***gadolinium***, ***nickel*** oxide, and alpha.-manganese sulfide

=> d 122 1,2,5,10,30 cbib abs hitstr hitind

L22 ANSWER 1 OF 43 HCA COPYRIGHT 2002 ACS
137:85003 Encapsulation of waste. Maddrell, Ewan Robert (British Nuclear Fuels PLC, UK). Brit. UK Pat. Appl. GB 2367419 A1 20020403, 21 pp. (English). CODEN: BAXXDU. APPLICATION: GB 2000-20405 20000819.

AB This method to immobilize highly active and medium active waste, from an advanced Purex reprocessing plant in which substantial amounts of the nonfuel components of a fuel assembly are dissolved during the head-end dissoln. step, comprises a Na phosphate glass. Wastes are calcined and the glass matrix formed has zirconia particles

distributed within it and dissolved in the glass there are elements from the dissolved ***nuclear*** ***fuel*** assemblies, ***cladding***, fission products, and other radioactive species from the irradiated ***nuclear*** ***fuel***.

IT ***7440-54-2***, Gadolinium, properties
(encapsulation of waste)

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

IT ***7440-02-0***, Nickel, processes
(encapsulation of waste)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IC ICM G21F009-00
CC ***71-11*** (Nuclear Technology)

Section cross-reference(s): 57

IT Calcination

Encapsulation

Fuel assemblies

High-level radioactive wastes

Nuclear ***fuel*** element ***cladding***

Purex fuel reprocessing

X-ray diffractometry

(encapsulation of waste)

IT 1308-38-9, Chromium oxide (Cr₂O₃), properties 1309-37-1, Iron oxide (Fe₂O₃), properties 1313-27-5, Molybdenum oxide (MoO₃), properties 1313-99-1, Nickel oxide (NiO), properties 1314-23-4, Zirconia, properties ***7440-54-2***, Gadolinium, properties 18282-10-5, Tin oxide (SnO₂)
(encapsulation of waste)

IT 7439-89-6, Iron, processes ***7440-02-0***, Nickel, processes

7440-23-5, Sodium, processes 7440-47-3, Chromium, processes

53572-14-8, Phosphorus oxide (PO₄)

(encapsulation of waste)

L22 ANSWER 2 OF 43 HCA COPYRIGHT 2002 ACS

137:85002 Encapsulation of waste. Maddrell, Ewan Robert (British Nuclear Fuels PLC, UK). Brit. UK Pat. Appl. GB 2367418 A1 20020403, 21 pp. (English). CODEN: BAXXDU. APPLICATION: GB 2000-20404 20000819.

AB This method to immobilize highly active and medium active waste, from an advanced Purex reprocessing plant in which substantial amts. of the non-fuel components of a fuel assembly are dissolved during the head-end dissoln. step, use a sodium zirconium phosphate matrix. Wastes are calcined and the spinel phase distributed in the matrix consists of elements from the dissolved ***nuclear*** ***fuel*** ***cladding*** and fuel assembly.

IT ***7440-54-2***, Gadolinium, properties
(encapsulation of waste)

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

IT ***7440-02-0***, Nickel, processes

(encapsulation of waste)

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IC ICM G21F009-00
CC ***71-11*** (Nuclear Technology)
Section cross-reference(s) : 57
IT Calcination
Encapsulation
High-level radioactive wastes
Nuclear ***fuel*** element ***cladding***
Purex fuel reprocessing
X-ray diffractometry
(encapsulation of waste)
IT 1308-38-9, Chromium oxide (Cr₂O₃), properties 1309-37-1, Iron
oxide (Fe₂O₃), properties 1313-27-5, Molybdenum oxide (MoO₃),
properties 1313-59-3, Sodium oxide (Na₂O), properties 1313-99-1,
Nickel oxide (NiO), properties 1314-23-4, Zirconia, properties
7440-54-2, Gadolinium, properties 18282-10-5, Tin oxide
(SnO₂)
(encapsulation of waste)
IT 7439-89-6, Iron, processes ***7440-02-0***, Nickel, processes
7440-23-5, Sodium, processes 7440-47-3, Chromium, processes
53572-14-8, Phosphorus oxide (PO₄)
(encapsulation of waste)

L22 ANSWER 5 OF 43 HCA COPYRIGHT 2002 ACS

132:314868 Fuel element for water-moderated power reactors. Savchenko,
A. M.; Maranchak, S. V.; Lysenko, V. A.; Vatulin, A. V.
(Gosudarstvennyi Nauchnyi Tsentr RF, Russia; Vserossiiskii). Russ.
RU 2112287 C1 19980527 From: Izobreteniya 1998, (15), 377-78.
(Russian). CODEN: RUXXE7. APPLICATION: RU 1996-115777 19960730.

AB Title only translated.

IT ***7440-02-0***, Nickel, uses
(fuel element for water-moderated power reactors comprising
fission particles coated with)

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IT ***7440-54-2***, Gadolinium, uses
(fuel element for water-moderated power reactors comprising
zirconium alloy contg.)
RN 7440-54-2 HCA
CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

IC ICM G21C003-58
ICS G21C003-64; G21C021-02
CC ***71-5*** (Nuclear Technology)
IT ***Nuclear*** ***fuels***
Water-cooled water-moderated ***nuclear*** reactors
(***fuel*** element for water-moderated power reactors)
IT 7439-98-7, Molybdenum, uses ***7440-02-0***, Nickel, uses
7440-03-1, Niobium, uses 7440-67-7, Zirconium, uses
(fuel element for water-moderated power reactors comprising

fission particles coated with)

IT ***7440-54-2*** , Gadolinium, uses 7440-58-6, Hafnium, uses
(fuel element for water-moderated power reactors comprising
zirconium alloy contg.)

L22 ANSWER 10 OF 43 HCA COPYRIGHT 2002 ACS

121:20686 Microparticle coating on inside of fuel rods and other fuel assembly components. Bryan, William J. (Combination Engineering, Inc., USA). U.S. US 5280510 A 19940118, 6 pp. (English). CODEN: USXXAM. APPLICATION: US 1992-951106 19920925.

AB A method for coating the inside surface of tubular components of a ***nuclear*** ***fuel*** assembly, including the steps of supporting the component within a vacuum chamber, positioning a source rod having a field emitter structure within the component, the structure being formed of material to be coated on the surface, and inducing an elec. current flow through the rod sufficient to evap. at least a portion of the emitter structure, whereby the evapd. material of the emitter structure is deposited on and adheres to the surface as a coating. Optionally, the vacuum chamber is back-filled with a reactive gas, and the material evapd. from the emitter structure chem. reacts with the gas before adhering to the surface. The reactive gas can be 1 of N, O, or C plasma and the coating adhered to the component can be 1 of a nitride, oxide, or carbide, resp.

IT ***7440-02-0*** , Nickel, uses ***7440-54-2*** , Gadolinium, uses

(***nuclear*** ***fuel*** component coating with)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

IC ICM G21C003-00

NCL 376414000

CC ***71-5*** (Nuclear Technology)

IT ***Nuclear*** reactor ***fuels*** and fuel elements
(microparticle coating on components of)

IT 1314-23-4, Zirconium oxide (ZrO₂), uses 1344-28-1, Aluminum oxide (Al₂O₃), uses ***7440-02-0*** , Nickel, uses 7440-42-8, Boron, uses 7440-52-0, Erbium, uses ***7440-54-2*** , Gadolinium, uses 7440-65-5, Yttrium, uses 7440-67-7, Zirconium, uses 10043-11-5, Boron nitride (BN), uses 12011-60-8, Chromium carbide (CrC) 12033-62-4, Tantalum nitride (TaN) 12045-63-5, Titanium boride (TiB₂) 12045-64-6, Zirconium boride (ZrB₂) 12069-32-8, Boron carbide (B₄C) 12070-08-5, Titanium carbide (TiC) 12070-12-1, Tungsten carbide 12070-14-3, Zirconium carbide (ZrC) 12627-33-7, Titanium carbide nitride 24094-93-7, Chromium nitride (CrN) 25658-42-8, Zirconium nitride (ZrN) 25817-87-2, Hafnium nitride (HfN) 97331-40-3 155760-15-9, Aluminum tantalum vanadium nitride (Al₂Ta₂V₂N₅) (***nuclear*** ***fuel*** component coating with)

L22 ANSWER 30 OF 43 HCA COPYRIGHT 2002 ACS

79:11010 Galvanomagnetic properties and phase composition of nickel-gadolinium films. Buravikhin, V. A.; Bochkarev, V. F.; Egorov, V. A.; Budanov, O. P. (USSR). Fiz. Magn. Plenok, No. 4,

33-9 From: Ref. Zh., Fiz., E. 1972, Abstr. No. 8E1516 (Russian)
1971.

AB The Hall effect and elec. resistivity of 1000-1500 .ANG. Ni-Gd (50%
Gd) films were studied at -170 to 500.degree.. Annealing at 200,
300, and 400.degree. changed the properties of the film because of
phase transformation.

IT ***39431-57-7***
(elec. resistance and Hall effect in, phase transitions in
relation to)

RN 39431-57-7 HCA

CN Nickel alloy, base, Ni 3-100, Gd 0-70 (9CI) (CA INDEX NAME)

Component	Component	Component
Percent	Registry Number	
Ni	30 - 100	7440-02-0
Gd	0 - 70	7440-54-2

CC ***71-2*** (Electric Phenomena)
Section cross-reference(s): 56, ***70***

IT ***39431-57-7***
(elec. resistance and Hall effect in, phase transitions in
relation to)

=> d his 124-

FILE 'HCA' ENTERED AT 15:39:14 ON 16 OCT 2002

L24 4865 S NEUTRON? (2A) (ABSORB? OR ABSORP? OR ADSORB? OR ADSORP? O
L25 7 S L24 AND L7
L26 0 S L24 AND L8
L27 14 S L9 AND L10 AND L24
L28 19 S (L25 OR L27) NOT L21

=> d 128 1-19 cbib abs hitstr hitind

L28 ANSWER 1 OF 19 HCA COPYRIGHT 2002 ACS
134:122605 A device for neutrons optics. Welzel, Stephan
(Hahn-Meitner-Institut Berlin G.m.b.H., Germany). Ger. Offen. DE
19936899 A1 20010208, 10 pp. (German). CODEN: GWXXBX.
APPLICATION: DE 1999-19936899 19990729.

AB A small device collimates and/or focuses cold neutrons. The axis of
the cylindrical device is approx. aligned with the direction of the
neutron flux. Cylindrical aluminum or copper layers are transparent
to neutrons and act as neutron conductors. Concentric layers of
either B, Cd or Gd act as ***neutron*** ***absorbers***. A
further reflecting layer, Ni foil, may be present. Instead of
having snugly fitting concentric layers, the different layers may
also be wrapped in a tight spiral with the axis of the device as
center. The order of the layers is as follows: transparent,
reflecting, and ***neutron*** ***absorbing*** layer. The
layers have thicknesses of about a .mu.m or a fraction of a .mu.m.
This cost effective device is small and has a reduced neutron loss.

IT ***7440-02-0***, Nickel, uses ***7440-54-2***, Gadolinium,
uses

(a device for neutrons optics)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA
CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

IC ICM G21K001-06
CC 71-7 (Nuclear Technology)
IT 7429-90-5, Aluminum, uses ***7440-02-0***, Nickel, uses
7440-42-8, Boron, uses 7440-43-9, Cadmium, uses 7440-50-8,
Copper, uses ***7440-54-2***, Gadolinium, uses
(a device for neutrons optics)

L28 ANSWER 2 OF 19 HCA COPYRIGHT 2002 ACS

133:273207 Advanced ***neutron*** ***absorber*** materials.
Branagan, Daniel J.; Smolik, Galen R. (Bechtel BWXT Idaho, LLC,
USA). U.S. US 6125912 A 20001003, 24 pp. (English). CODEN:
USXXAM. APPLICATION: US 1999-243229 19990202. PRIORITY: US
1998-PV75350 19980202.

AB A ***neutron*** ***absorbing*** material and method
utilizing rare earth elements such as gadolinium, europium and
samarium to form metallic glasses and/or noble base nano/microcryst.
materials, the ***neutron*** ***absorbing*** material having
a combination of superior neutron capture cross sections coupled
with enhanced resistance to corrosion, oxidn. and leaching.

IT ***7440-54-2***, Gadolinium, uses
(advanced ***neutron*** ***absorber*** materials
comprising)

RN 7440-54-2 HCA
CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

IT ***7440-02-0***, Nickel, uses
(advanced ***neutron*** ***absorber*** materials with
enhanced resistance to corrosion. oxidn. and leaching comprising)

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IC ICM B22D011-06
ICS B29B009-00; C22C038-00
NCL 164046000
CC 71-11 (Nuclear Technology)
Section cross-reference(s): 56
ST ***neutron*** ***absorber*** materials gadolinium resistant
corrosion oxidn leaching; metallic glass transition metal europium
samarium gadolinium ***neutron*** ***absorber***
IT ***Absorbents***
Nanocrystalline materials
(advanced ***neutron*** ***absorber*** materials)
IT Metallic glasses
(advanced ***neutron*** ***absorber*** materials)
IT Corrosion
Leaching
Oxidation
(advanced ***neutron*** ***absorber*** materials
comprising Gd, Sm and Eu with enhanced resistance to)

IT Radioactive wastes
(advanced ***neutron*** ***absorber*** materials with enhanced resistance to corrosion. oxidn. and leaching)

IT Transition metals, uses
(advanced ***neutron*** ***absorber*** materials with enhanced resistance to corrosion. oxidn. and leaching comprising)

IT X-ray diffraction
(by advanced ***neutron*** ***absorber*** materials from metallic glasses contg. gadolinium, europium or samarium)

IT Phase transition
(from metastable cryst. to cryst.; in advanced ***neutron*** ***absorber*** materials from metallic glasses contg. gadolinium, europium or samarium)

IT Phase composition
(of advanced ***neutron*** ***absorber*** materials with enhanced resistance to corrosion. oxidn. and leaching)

IT 12586-31-1, ***Neutron***
(advanced ***neutron*** ***absorber*** materials)

IT 7440-19-9, Samarium, uses 7440-53-1, Europium, uses ***7440-54-2***, Gadolinium, uses
(advanced ***neutron*** ***absorber*** materials comprising)

IT 237081-62-8 237081-65-1 237081-69-5
(advanced ***neutron*** ***absorber*** materials with enhanced resistance to corrosion. oxidn. and leaching)

IT 7439-89-6, Iron, uses ***7440-02-0***, Nickel, uses 7440-22-4, Silver, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses
(advanced ***neutron*** ***absorber*** materials with enhanced resistance to corrosion. oxidn. and leaching comprising)

IT 7440-21-3, Silicon, uses 7440-42-8, Boron, uses 7440-44-0, Carbon, uses 7723-14-0, Phosphorus, uses
(advanced ***neutron*** ***absorber*** materials with enhanced resistance to corrosion. oxidn. and leaching comprising base alloy contg.)

L28 ANSWER 3 OF 19 HCA COPYRIGHT 2002 ACS

133:109123 Temporal variability of atmospheric trace element concentrations over the eastern Mediterranean Sea. Gullu, G. H.; Olmez, I.; Tuncel, G. (Department of Environmental Engineering, Hacettepe University, Ankara, 06532, Turk.). Spectrochimica Acta, Part B: Atomic Spectroscopy, 55B(7), 1135-1150 (English) 2000. CODEN: SAASBH. ISSN: 0584-8547. Publisher: Elsevier Science B.V..

AB Elements and ions measured in aerosols collected from Mar. 1992 to Dec. 1993 were examd. to understand temporal variability of elemental concns. Samples were analyzed by at. ***absorption*** spectrometry, instrumental ***neutron*** activation anal., ion chromatog., and colorimetry for .apprx.40 elements and major ions. Element concns. varied greatly on time scales ranging from days to seasons. Short-term variations in concns. of pollution-derived elements were explained by transport from source regions. Short-term variations in concns. of sea-salt and crustal elements were due to the episodic nature of wind-induced particle generation mechanisms. Transport failed to explain long-term variations due to lack of seasonal changes in air mass transport patterns. Seasonal variations in concns. of anthropogenic elements were detd. by wet deposition of particles (more extensive in the wet season) and distances between source regions and sampling sites. Long-term variations in the concns. of crustal and sea-salt elements were explained by seasonal changes in their source strengths. Distant rains on the path of air masses which transport anthropogenic

particles to the eastern Mediterranean were more influential on the
obsd. seasonal behavior of pollution-derived elements than local
rain events.

IT ***7440-02-0*** , Nickel, occurrence ***7440-54-2*** ,
Gadolinium, occurrence
(meteorol. and atm. pptn. effect on short- and long-term
variability of elemental and ionic compn. of airborne particles
over eastern Mediterranean Sea)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 59-2 (Air Pollution and Industrial Hygiene)
IT 7429-90-5, Aluminum, occurrence 7429-91-6, Dysprosium, occurrence
7439-89-6, Iron, occurrence 7439-91-0, Lanthanum, occurrence
7439-92-1, Lead, occurrence 7439-95-4, Magnesium, occurrence
7439-96-5, Manganese, occurrence 7439-97-6, Mercury, occurrence
7440-00-8, Neodymium, occurrence ***7440-02-0*** , Nickel,
occurrence 7440-09-7, Potassium, occurrence 7440-19-9, Samarium,
occurrence 7440-20-2, Scandium, occurrence 7440-23-5, Sodium,
occurrence 7440-27-9, Terbium, occurrence 7440-29-1, Thorium,
occurrence 7440-32-6, Titanium, occurrence 7440-36-0, Antimony,
occurrence 7440-38-2, Arsenic, occurrence 7440-45-1, Cerium,
occurrence 7440-46-2, Cesium, occurrence 7440-47-3, Chromium,
occurrence 7440-48-4, Cobalt, occurrence 7440-53-1, Europium,
occurrence ***7440-54-2*** , Gadolinium, occurrence 7440-58-6,
Hafnium, occurrence 7440-62-2, Vanadium, occurrence 7440-64-4,
Ytterbium, occurrence 7440-66-6, Zinc, occurrence 7440-70-2,
Calcium, occurrence 7726-95-6, Bromine, occurrence 7782-49-2,
Selenium, occurrence 7782-50-5, Chlorine, occurrence 14798-03-9,
Ammonium, occurrence
(meteorol. and atm. pptn. effect on short- and long-term
variability of elemental and ionic compn. of airborne particles
over eastern Mediterranean Sea)

L28 ANSWER 4 OF 19 HCA COPYRIGHT 2002 ACS

131:162504 Advanced ***neutron*** ***absorber*** materials.

Branagan, Daniel J.; Smolik, Galen R. (Lockheed Martin Idaho
Technologies Company, USA). PCT Int. Appl. WO 9943005 A2 19990826,
38 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR,
BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU,
ID, IL, IS, JP, KE, KG, KP, KR, LZ, LC, LK, LR, LS, LT, LU, LV, MD,
MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL,
TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU,
TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI,
FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG.
(English). CODEN: PIXXD2. APPLICATION: WO 1999-US2246 19990202.

PRIORITY: US 1998-PV73350 19980202.

AB A n absorbing material and method using rare earth elements such as
Gd Eu and Sm to form metallic glasses and/or noble base
nano/microcryst. materials, the n absorbing material having a
combination of superior n capture cross sections coupled with
enhanced resistance to corrosion, oxidn. and leaching.

IC ICM G21C

CC 71-9 (Nuclear Technology)
ST Section cross-reference(s): 56
neutron ***absorber*** gadolinium samarium europium
metallic glass; amorphous alloy ***neutron*** ***absorber***
IT Metallic glasses
(advanced ***neutron*** ***absorber*** materials)
IT Metallic glasses
(iron alloy; advanced ***neutron*** ***absorber***
materials)
IT Metallic glasses
(nickel alloy; advanced ***neutron*** ***absorber***
materials)
IT 7440-19-9, Samarium, uses 7440-53-1, Europium, uses 7440-54-2,
Gadolinium, uses 237081-62-8, Chromium 24.4, gadolinium 1, iron
3.27, molybdenum 8.12, nickel 62.4, tungsten 0.69, vanadium 0.2
(atomic) 237081-63-9, Chromium 22.6, gadolinium 8, iron 3.04,
molybdenum 7.54, nickel 58, tungsten 0.64, vanadium 0.18 (atomic)
237081-66-2, Boron 19.8, ***gadolinium*** 1, ***nickel***
79.2 (atomic) 237081-67-3, Boron 18.4, ***gadolinium*** 8,
nickel 73.6 (atomic) 237081-68-4, Copper 29.7,
gadolinium 1, ***nickel*** 69.3 (atomic) 237081-69-5,
Copper 27.6, ***gadolinium*** 8, ***nickel*** 64.4 (atomic)
237081-70-8, Boron 19.8, copper 23.8, ***gadolinium*** 1,
nickel 55.4 (atomic) 237081-71-9, Boron 18.4, copper 22.1,
gadolinium 8, ***nickel*** 51.5 (atomic) 237081-72-0,
Boron 18.4, chromium 18.1, gadolinium 8, iron 2.43, molybdenum 6.03,
nickel 46.4, tungsten 0.52, vanadium 0.15 (atomic) 237081-73-1,
Boron 19.8, chromium 19.5, gadolinium 1, iron 2.61, molybdenum 6.49,
nickel 49.9, tungsten 0.55, vanadium 0.16 (atomic)
(advanced ***neutron*** ***absorber*** materials)
IT 162395-46-2, Boron 19.8, gadolinium 1, iron 79.2 (atomic)
237081-61-7, Boron 18.6, Iron 73.6, gadolinium 8 (atomic)
237081-64-0, Boron 19.8, chromium 15.8, gadolinium 1, iron 63.4
(atomic) 237081-65-1, Boron 18.4, chromium 14.7, gadolinium 8,
iron 58.9 (atomic)
(metallic glass; advanced ***neutron*** ***absorber***
materials)

L28 ANSWER 5 OF 19 HCA COPYRIGHT 2002 ACS
127:284865 161Dy and 155Gd Mossbauer spectroscopy of the RTC2
intermetallics (R = Dy, ***Gd***; T = ***Ni***, Co).
Onodera, Hideya; Amanai, Hidetaka; Matsuo, Satoru; Kosaka, Masashi;
Kobayashi, Hisao; Ohashi, Masayoshi; Yamaguchi, Yasuo (Institute for
Materials Research, Tohoku University, Sendai, 980-77, Japan).
Science Reports of the Research Institutes, Tohoku University,
Series A: Physics, Chemistry, and Metallurgy, 45(1), 1-10 (English)
1997. CODEN: SRTAA6. ISSN: 0040-8808. Publisher: Tohoku
University, Institute for Materials Research.

AB 161Dy and 155Gd Mossbauer spectroscopic studies on DyCoC2, DyNiC2,
GdCoC2, and GdNiC2 which were performed to obtain microscopic
information on magnetic properties are reviewed with 27 refs. The
expts. were done using the std. 161Tb and 155Eu Mossbauer sources
prep'd. by neutron irradn. at the Japan Material Testing Reactor. A
simple ferromagnetic DyCoC2 is a good object to compare the magnetic
hyperfine field with the magnetic moment detd. precisely by the
magnetization measurement of the single cryst. sample. DyNiC2 is an
antiferromagnet with commensurate magnetic structure and
incommensurate moment-modulation structure. The magnetic hyperfine
field changes correspondently well with the both magnetic
structures. The 155Gd Mossbauer spectroscopy is useful to det. the

moment direction in the Gd compds. which are rarely studied by neutron diffraction because of large ***neutron*** ***absorption*** cross section of the natural Gd nuclei. The cryst. elec. field parameter A.degree.2 detd. from the quadrupole interaction acting on Gd is also useful to interpret the magnetic anisotropy of the other rare earth atoms in the isostructural compds.

CC 73-0 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 77
IT Magnetic anisotropy
Magnetic moment
Magnetization
Mossbauer effect
(of dysprosium or ***gadolinium*** cobalt or ***nickel*** dicarbides)
IT 87435-13-0, ***Gadolinium*** ***nickel*** carbide (GdNiC2)
102426-29-9, Cobalt gadolinium carbide (CoGdC2)
(***gadolinium*** -155 Mossbauer spectra and magnetic properties of)

L28 ANSWER 6 OF 19 HCA COPYRIGHT 2002 ACS
113:196501 Ceramic-ceramic or ceramic-metal joints, and nondestructive testing thereof. Tanaka, Shunichiro (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 02069645 A2 19900308 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1988-220510 19880905.
AB An interlayer in title joints comprises: (a) a compd. contg. an element having low thermal ***neutron*** ***absorption*** coeff. .gamma. and (b) a compd. contg. an element with high .gamma., where b is uniformly dispersed in a. The bonding state is detd. by irradiating the joint with thermal neutrons and imaging the distribution of high-.gamma. element according to the intensity of transmitted neutrons.
IT ***7440-02-0*** , Nickel, uses and miscellaneous (joints with silicon nitride ceramics, nondestructive-testing of boron carbide-contg. interlayer in, by thermal neutrons)
RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IT ***7440-54-2*** , Gadolinium, uses and miscellaneous (zirconia ceramic joints with interlayer contg., nondestructive testing of, by thermal neutrons)
RN 7440-54-2 HCA
CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

IC ICM G01N023-09
CC 57-2 (Ceramics)
IT ***7440-02-0*** , Nickel, uses and miscellaneous (joints with silicon nitride ceramics, nondestructive-testing of boron carbide-contg. interlayer in, by thermal neutrons)
IT 7440-31-5, Tin, uses and miscellaneous 7440-53-1, Europium, uses and miscellaneous ***7440-54-2*** , Gadolinium, uses and miscellaneous (zirconia ceramic joints with interlayer contg., nondestructive testing of, by thermal neutrons)

L28 ANSWER 7 OF 19 HCA COPYRIGHT 2002 ACS

110:33008 Radiochemical separation by magnesium oxide adsorption and applications. Yeh, Si Jung; Lo, J. M.; Tseng, C. L. (Inst. Nucl. Sci., Natl. Tsing Hua Univ., Hsinchu, Taiwan). J. Radioanal. Nucl. Chem., 124(1), 157-70 (English) 1988. CODEN: JRNCMD. ISSN: 0236-5731.

AB The radioactive tracer technique was used to investigate the adsorption behavior of 47 ions onto hydrous magnesium oxide. Detailed studies on Co(II), Zn(II), La(III) and Ce(III) reveal that the adsorption isotherms of these ions obey Langmuir's law. Radiochem. sepn. using hydrous magnesium oxide was applied to the neutron activation anal. of NBS std. ref. materials, and satisfactory results were obtained. Hydrous magnesium oxide was also used to adsorb various ions from aq. soln. for the purpose of preconcn. which was followed by neutron activation or inductively coupled plasma-at. emission spectrometric anal. Satisfactory results have been obsd. in both methods.

IT ***7440-02-0*** , properties ***7440-54-2*** , properties (adsorption of, on hydrous magnesium oxide)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 79-4 (Inorganic Analytical Chemistry)

ST radiochem sepn adsorption hydrous magnesium oxide; ***neutron*** activation analysis ***adsorption*** magnesium oxide; atomic emission analysis adsorption magnesium oxide

IT Trace elements, analysis
(detn. of, by at. emission spectrometry or ***neutron*** activation, ***adsorption*** sepn. on hydrous magnesium oxide for)

IT 7429-91-6, properties 7439-94-3, properties 7439-97-6, properties 7439-98-7, properties 7440-00-8, properties ***7440-02-0*** , properties 7440-05-3, properties 7440-09-7, properties 7440-10-0, properties 7440-16-6, properties 7440-17-7, properties 7440-18-8, properties 7440-22-4, properties 7440-24-6, properties 7440-30-4, properties 7440-33-7, properties 7440-36-0, properties 7440-38-2, properties 7440-39-3, properties 7440-43-9, properties 7440-46-2, properties 7440-47-3, properties 7440-50-8, properties 7440-52-0, properties 7440-53-1, properties ***7440-54-2*** , properties 7440-55-3, properties 7440-58-6, properties 7440-60-0, properties 7440-64-4, properties 7440-74-6, properties 7782-49-2, properties 14265-44-2, Phosphate, properties 24959-67-9, Bromide, properties (adsorption of, on hydrous magnesium oxide)

IT 7439-91-0, Lanthanum, analysis 7440-45-1, Cerium, analysis 7440-48-4, Cobalt, analysis 7440-66-6, Zinc, analysis 7440-67-7, Zirconium, analysis
(detn. of, by at. emission spectrometry or ***neutron*** activation, ***adsorption*** sepn. on hydrous magnesium oxide for)

IT 7439-89-6, Iron, analysis 7439-96-5, Manganese, analysis 7440-19-9, Samarium, analysis 7440-20-2, Scandium, analysis

7440-23-5, Sodium, analysis
(detn. of, by ***neutron*** activation, ***adsorption***
sepn. on hydrous magnesium oxide for)

L28 ANSWER 8 OF 19 HCA COPYRIGHT 2002 ACS

97:166455 Natural production of tritium in permeable rocks. Andrews, J. N.; Kay, R. L. F. (Sch. Chem., Univ. Bath, Bath, BA2 7AY, UK). Nature (London), 298(5872), 361-3 (English) 1982. CODEN: NATUAS. ISSN: 0028-0836.

AB The U, Th, Li, and B contents of the rock and its matrix porosity det. the T content of its fracture fluids. Granites with high U, Th, Li contents, low B content, and a low porosity may have a naturally maintained T content of .apprx.2.5 T.U. in H₂O within the matrix. This has important implications for the interpretation of groundwater flow patterns from their T contents.

IT ***7440-02-0***, properties ***7440-54-2***, properties
(***neutron*** ***absorption*** by, in rocks, tritium formation in relation to)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 53-3 (Mineralogical and Geological Chemistry)
IT 7429-90-5, properties 7439-89-6, properties 7439-95-4, properties 7439-96-5, properties ***7440-02-0***, properties 7440-09-7, properties 7440-19-9, properties 7440-23-5, properties 7440-32-6, properties 7440-47-3, properties 7440-48-4, properties ***7440-54-2***, properties 7440-70-2, properties 7631-86-9, properties 7782-50-5, properties
(***neutron*** ***absorption*** by, in rocks, tritium formation in relation to)

L28 ANSWER 9 OF 19 HCA COPYRIGHT 2002 ACS

97:13778 Neutron-optical properties of multilayer systems with absorption. Ebisawa, Toru; Akiyoshi, Tsunekazu; Achiwa, Norio; Yamada, Shusaku; Okamoto, Sunao (Res. React. Inst., Kyoto Univ., Osaka, 590-04, Japan). Annu. Rep. Res. React. Inst., Kyoto Univ., 14, 10-18 (English) 1981. CODEN: KURAAV. ISSN: 0454-9244.

AB The n optical properties of multilayer systems with absorption were studied with a conventional n optical calcn. including complex refractive index. The reflectivities of films contg. Gd were calcd., and a homogeneous ***Gd***-Ti-***Ni*** film is proposed as an excellent anti-reflection film. The optical enhancement of n absorption due to thin layer interference is demonstrated by calcns. of the reflectivities of optical systems with an absorbing film deposited on a total reflecting film. The redn. of the reflectivity of Ni-Ti supermirror of 25,000 .ANG. total thickness could be suppressed to only several percent when the preferable order of layer thickness distribution is chosen.

IT ***7440-02-0***, properties
(films, neutron reflectivities of)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

IT ***7440-54-2*** , properties
(neutron reflectivities on films of)
RN 7440-54-2 HCA
CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 71-8 (Nuclear Technology)
Section cross-reference(s): 56, 70
ST neutron reflectivity gadolinium film; ***absorption***
neutron optical enhancement; mirror neutron reflection
refraction; nickel titanium supermirror neutron reflectivity
IT Mirrors
(super-, nickel-titanium, ***neutron*** ***absorption***
effects on reflectivity of)
IT ***7440-02-0*** , properties 7440-57-5, properties
(films, neutron reflectivities of)
IT ***7440-54-2*** , properties 14391-32-3, properties
(neutron reflectivities on films of)

L28 ANSWER 10 OF 19 HCA COPYRIGHT 2002 ACS

93:197046 Geochemical analyses of copper-silver-bearing rocks in the
Spokane Formation (Belt Supergroup), Lewis and Clark County,
Montana. Connor, J. J.; McNeal, J. M.; Crock, J. G. (Geol. Surv.,
United States Dep. Interior, Washington, DC, USA). Geol. Surv.
Open-File Rep. (U. S.), 79-1440, 27 pp. (English) 1979. CODEN:
GSORDC. ISSN: 0163-0393.

AB Thirty samples were collected from 7 of the deposits in outcrop and
37 were collected from the Alice Creek mine and analyzed for a large
no. of elements as part of general survey of the mineral potential
of the Rogers Pass area. The anal. methods used were x-ray
fluorescence, at. ***absorption*** spectrometry, spectrogr.,
neutron activation, gasometry, and titrn.

IT ***7440-02-0*** , analysis ***7440-54-2*** , analysis
(detn. of, in copper-silver-bearing rocks in Spokane formations
in Montana)

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA
CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 79-6 (Inorganic Analytical Chemistry)
IT 7429-90-5, analysis 7429-91-6, analysis 7439-89-6, analysis
7439-91-0, analysis 7439-92-1, analysis 7439-93-2, analysis
7439-95-4, analysis 7439-96-5, analysis 7439-97-6, analysis
7439-98-7, analysis 7440-00-8, analysis ***7440-02-0***,
analysis 7440-03-1, analysis 7440-09-7, analysis 7440-10-0,
analysis 7440-19-9, analysis 7440-20-2, analysis 7440-21-3,
analysis 7440-22-4, analysis 7440-23-5, analysis 7440-24-6,
analysis 7440-27-9, analysis 7440-29-1, analysis 7440-30-4,
analysis 7440-31-5, analysis 7440-32-6, analysis 7440-36-0,
analysis 7440-38-2, analysis 7440-39-3, analysis 7440-41-7,
analysis 7440-42-8, analysis 7440-43-9, analysis 7440-44-0,

analysis 7440-45-1, analysis 7440-47-3, analysis 7440-48-4,
analysis 7440-50-8, analysis 7440-52-0, analysis 7440-53-1,
analysis ***7440-54-2***, analysis 7440-55-3, analysis
7440-56-4, analysis 7440-61-1, analysis 7440-62-2, analysis
7440-64-4, analysis 7440-65-5, analysis 7440-66-6, analysis
7440-67-7, analysis 7440-70-2, analysis 7704-34-9, analysis
7723-14-0, analysis 7782-49-2, analysis
(detn. of, in copper-silver-bearing rocks in Spokane formations
in Montana)

L28 ANSWER 11 OF 19 HCA COPYRIGHT 2002 ACS

90:132240 Activation of elements with reactor neutrons using a
cadmium-boron filter. Akbarov, U.; Ashrapov, T. B.; Uzakova, U.;
Umirbekov, K. (USSR). Deposited Doc., VINITI 3203-77, 11 pp.
Avail. VINITI (Russian) 1977.

AB The selectivity of detns. by activation with neutrons from nuclear
reactors can be improved by using Cd-B filters. The
absorption of ***neutrons*** by B carbide filters at 2
thicknesses (0.2 and 1.5 g/cm²) was calcd. as a function of neutron
energy (0.025-1000 eV). The Cd ratios and Cd-B ratios were detd.
for elements with at. nos. 11-92.

IT ***7440-02-0***, analysis ***7440-54-2***, analysis
(detn. of, by neutron activation, boron-cadmium filters in)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 79-6 (Inorganic Analytical Chemistry)

Section cross-reference(s): 71

IT 7429-90-5, analysis 7429-91-6, analysis 7439-88-5, analysis
7439-89-6, analysis 7439-91-0, analysis 7439-94-3, analysis
7439-95-4, analysis 7439-96-5, analysis 7439-97-6, analysis
7439-98-7, analysis 7440-00-8, analysis ***7440-02-0***,
analysis 7440-03-1, analysis 7440-04-2, analysis 7440-05-3,
analysis 7440-06-4, analysis 7440-09-7, analysis 7440-10-0,
analysis 7440-15-5, analysis 7440-16-6, analysis 7440-17-7,
analysis 7440-18-8, analysis 7440-19-9, analysis 7440-20-2,
analysis 7440-21-3, analysis 7440-22-4, analysis 7440-23-5,
analysis 7440-24-6, analysis 7440-25-7, analysis 7440-27-9,
analysis 7440-30-4, analysis 7440-31-5, analysis 7440-32-6,
analysis 7440-33-7, analysis 7440-36-0, analysis 7440-38-2,
analysis 7440-39-3, analysis 7440-43-9, analysis 7440-45-1,
analysis 7440-46-2, analysis 7440-47-3, analysis 7440-48-4,
analysis 7440-50-8, analysis 7440-52-0, analysis 7440-53-1,
analysis ***7440-54-2***, analysis 7440-55-3, analysis
7440-56-4, analysis 7440-57-5, analysis 7440-58-6, analysis
7440-60-0, analysis 7440-61-1, analysis 7440-62-2, analysis
7440-64-4, analysis 7440-65-5, analysis 7440-66-6, analysis
7440-70-2, analysis 7440-74-6, analysis 7553-56-2, analysis
7726-95-6, analysis 7782-49-2, analysis 7782-50-5, analysis
13494-80-9, analysis
(detn. of, by neutron activation, boron-cadmium filters in)

L28 ANSWER 12 OF 19 HCA COPYRIGHT 2002 ACS

87:94937 Determination of 22 minor and trace elements in 8 new USGS standard rocks by instrumental activation analysis with epithermal neutrons. Rowe, J. J.; Steinnes, Eiliv (U. S. Geol. Surv., Reston, Va., USA). J. Res. U. S. Geol. Surv., 5(3), 397-402 (English) 1977. CODEN: JRGSAW.

AB Epithermal neutron activation analyses results of the 8 new USGS std. rocks are compared with results by spectrog., x-ray fluorescence, at. ***absorption***, radiochem. ***neutron*** activation, instrumental neutron activation (thermal neutrons), isotope diln. mass spectrometric, spectrofluorometric, radioisotope diln. and delayed-neutron techniques for 22 elements. Results indicate the technique to be useful and dependable esp. for Ni, Se, Rb, Sr, Mo, Ba, Tm, Ta, Th and U.

IT ***7440-02-0***, analysis ***7440-54-2***, analysis (detn. of, in std. rocks by epithermal neutron activation)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 79-6 (Inorganic Analytical Chemistry)

IT 7439-98-7, analysis 7440-00-8, analysis ***7440-02-0***, analysis 7440-17-7, analysis 7440-19-9, analysis 7440-20-2, analysis 7440-24-6, analysis 7440-25-7, analysis 7440-27-9, analysis 7440-29-1, analysis 7440-30-4, analysis 7440-36-0, analysis 7440-39-3, analysis 7440-45-1, analysis 7440-46-2, analysis 7440-48-4, analysis 7440-53-1, analysis ***7440-54-2***, analysis 7440-58-6, analysis 7440-61-1, analysis 7440-64-4, analysis 7782-49-2, analysis (detn. of, in std. rocks by epithermal neutron activation)

L28 ANSWER 13 OF 19 HCA COPYRIGHT 2002 ACS

84:81419 Measurement of burnable poison absorptions and critical assemblies. Radowsky, Alvin (United States Atomic Energy Commission, USA). Def. Publ. U. S. Pat. Off. T US 940009 19751104, 9 pp. (English). CODEN: USXXBN. APPLICATION: US 1974-472926 19740523.

AB A method and app. are described for measuring the n absorption characteristics of burnable poison elements within a nuclear reactor. A container of the same size and shape of the burnable poison element is located within the core and connected to inlet and outlet lines, has a mixing tank means, a pump, and a counting system such that various solns. having concns. of the burnable poison may be circulated through the reactor to det. various burnable poison absorption characteristics without shutting down the reactor. For example, the burnable poison comprises boric acid with a concn. ratio of Ni/boric acid of 1:20 to 1:25.

IT ***7440-02-0***, uses and miscellaneous ***7440-54-2***, uses and miscellaneous (burnable poison contg. boron and, ***neutron*** ***absorption*** characteristics of)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA
CN Gadolinium (8CI, 9CI) (CA INDEX NAME)
Gd
IC G21C
NCL 176019000R
CC 71-7 (Nuclear Technology)
ST burnable poison absorption crit assembly; ***neutron***
absorption burnable poison; boron burnable poison reactor;
gadolinium burnable poison reactor; reactor burnable poison
absorption; nickel burnable poison reactor
IT Nuclear reactors
(***neutron*** ***absorption*** characteristics of
burnable poison elements in)
IT ***7440-02-0***, uses and miscellaneous ***7440-54-2***, uses
and miscellaneous
(burnable poison contg. boron and, ***neutron***
absorption characteristics of)
IT 7440-42-8, uses and miscellaneous
(burnable poison, with gadolinium, ***neutron***
absorption characteristics of)

L28 ANSWER 14 OF 19 HCA COPYRIGHT 2002 ACS
78:143389 ***Neutron*** self- ***absorption*** in activation
analysis. Gruber, E. (Anal. Inst., Univ. Wien, Vienna, Austria).
Fresenius' Z. Anal. Chem., 263(3), 194-202 (German) 1973. CODEN:
ZACFAU.

AB Models were developed for the estn. of the influence of
self-absorption in the irradn. of targets with neutrons. The effect
of neutron flux depression was quant. detd. by a parabolic approxn.
Thus, its influence could be taken into consideration in practical
activation anal. For any usual material of approx. known compn.,
the max. flux depression may be detd. by using the equations,
diagrams, and tables reported.

IT ***7440-02-0***, analysis ***7440-54-2***, analysis
(***neutron*** activation, self- ***absorption***
corrections in)

RN 7440-02-0 HCA
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA
CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 79-1 (Inorganic Analytical Chemistry)
Section cross-reference(s): 75
ST ***neutron*** ***absorption*** activation analysis
IT Radiochemical analysis
(***neutron*** activation, self- ***absorption***
corrections in)
IT Chromium alloy, nonbase, Fe 79, Cr 19, Ti 1.5, C 0.1
Iron alloy, base
Titanium alloy, nonbase, Fe 79, Cr 19, Ti 1.5, C 0.1
(***neutron*** activation, self- ***absorption***
corrections in)

IT 7429-91-6, analysis 7439-88-5, analysis 7439-89-6, analysis
7439-91-0, analysis 7439-93-2, analysis 7439-94-3, analysis
7439-96-5, analysis 7439-97-6, analysis 7440-00-8, analysis
7440-02-0, analysis 7440-04-2, analysis 7440-05-3,
analysis 7440-06-4, analysis 7440-10-0, analysis 7440-15-5,
analysis 7440-16-6, analysis 7440-18-8, analysis 7440-19-9,
analysis 7440-20-2, analysis 7440-22-4, analysis 7440-25-7,
analysis 7440-27-9, analysis 7440-29-1, analysis 7440-30-4,
analysis 7440-32-6, analysis 7440-33-7, analysis 7440-36-0,
analysis 7440-38-2, analysis 7440-42-8, analysis 7440-43-9,
analysis 7440-46-2, analysis 7440-47-3, analysis 7440-48-4,
analysis 7440-50-8, analysis 7440-52-0, analysis 7440-53-1,
analysis ***7440-54-2***, analysis 7440-57-5, analysis
7440-58-6, analysis 7440-60-0, analysis 7440-61-1, analysis
7440-62-2, analysis 7440-64-4, analysis 7440-74-6, analysis
7553-56-2, analysis 7726-95-6, analysis 7782-49-2, analysis
12597-69-2, analysis
(***neutron*** activation, self- ***absorption***
corrections in)

L28 ANSWER 15 OF 19 HCA COPYRIGHT 2002 ACS

66:91299 Possibility of elemental analysis by use of neutron-capture
.gamma.-rays due to neutrons from low-level sources. Okada, Minoru
Tokyo Kogyo Shikensho Hokoku, 61(10), 448-55 (Japanese) 1966.
CODEN: TKSHAI.

AB A chart in which thermal-neutron-capture .gamma.-rays are arranged
by thermal ***neutron*** ***absorption*** cross-section and
.gamma.-ray energy was prep'd. An attempt was made to observe
neutron-capture .gamma.-rays of standard samples of several
elements, e.g.: Gd (Gd2O3), Cd (CdO), B (H3BO3), Li (Li2C2O4), Cl
(BaCl2.2H2O), Ti (Ti powder), and Ni [Ni(OH)2], which were thought
to emit capture .gamma.-rays of relatively high intensities. A 50-
and a 250-mc. Ra-Be neutron source were used with H2O and paraffin
as moderators, resp. The scintillation spectrometer used consisted
of a 5 .times. 4-in. NaI crystal and a pulse-height analyzer. From
the expts., both signal-to-noise ratio and neutron flux were too
small to obtain an appreciable photopeak within several counting
hrs. An improved device by which the capture .gamma.-rays of Gd,
Sm, Cd, Dy, Cl, Co, Ag, Sc, Mn, Se, N, Ti, Ni, and Cr could be
detected is presented.

IT ***7440-02-0***, analysis ***7440-54-2***, analysis
(detn. of, by neutron activation)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA
CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 79 (Inorganic Analytical Chemistry)
IT 7429-91-6, analysis 7439-93-2, analysis 7439-96-5, analysis
7440-02-0, analysis 7440-19-9, analysis 7440-20-2,
analysis 7440-22-4, analysis 7440-32-6, analysis 7440-42-8,
analysis 7440-43-9, analysis 7440-47-3, analysis 7440-48-4,
analysis ***7440-54-2***, analysis 7727-37-9, analysis
7782-49-2, analysis 7782-50-5, analysis
(detn. of, by neutron activation)

63:69598 Original Reference No. 63:12750h,12751a-b Stainless steel-gadolinium alloys. Copeland, M.; Barstow, W.; Armantrout, C.; Kato, H. (U.S. Bur. of Mines, Albany, OR). U.S. Bur. Mines, Rept. Invest., No. 6636(7), 29 pp. (English) 1965.

AB Gd may be a potential ***neutron*** ***absorber*** for controlling powerproducing reactors because of its high thermal neutron capture cross section of 46,000 barnes. Pure Gd is reactive and must be clad to protect it from corrosion or alloyed to make it corrosion resistant. Phase relations were detd. for Gd alloyed up to 40 wt. % with 304-type stainless steel. Body-centered-cubic (b.c.c) and face-centered-cubic (f.c.c.) Fe-rich solid soln. phases and several intermetallic Gd-contg. compds. of variable compn. approximating the formulas Fe9Gd, Ni7Gd2, Ni3Gd, Fe2Gd, NiGd, and NiGd3 were identified. Fe9Gd and Ni7Gd2 melted at 1080.degree. at .apprx.0.-2 wt. % Gd. The m.p. of Fe9Gd increased with increasing Gd content to a plateau at .apprx.1230.degree. and 30 wt. % Gd, and the m.p. of Ni7Gd2 decreased to a plateau at 900.degree. and 30 wt. % Gd, where Ni3Gd, NiGd, and Fe2Gd coexist. B.c.c. Fe solid soln. was stable from 1 to 2 wt. % Gd to higher contents, 30 wt. % Gd or more, and f.c.c. Fe up to 12 wt. % Gd below 1200.degree.. The stability of these phases above 1200.degree. was not resolved, except for the m.ps. Fabrication variables and mech. and corrosion properties of alloys contg. up to 5 wt. % Gd were studied. Equilibrating and forming operations were done best at 940-1080.degree.. Some variability in the yield and tensile strengths of alloys was noted. There was a continual decrease in ductility and impact resistance with increasing Gd contents. The resistance of the alloys to corrosion in water at 354.degree. was about the same as stainless steel.

CC 19 (Ferrous Metals and Alloys)

IT Crystal structure

(of chromium- ***Gd*** -Fe- ***Ni*** alloys and compds.)

IT Corrosion and Corrosion prevention

(of chromium- ***Gd*** -Fe- ***Ni*** alloys by water)

IT Iron, with gadolinium (Fe2Gd)

IT Iron, with gadolinium (Fe9Gd)

Nickel compounds, with ***gadolinium*** (GdNi)

Nickel compounds, with ***gadolinium*** (GdNi3)

Nickel compounds, with ***gadolinium*** (Gd2Ni7)

Nickel compounds, with ***gadolinium*** (Gd3Ni)

(in Cr- ***Gd*** -Fe- ***Ni*** system)

IT Gadolinium compounds

(with indium (GdIn3), in Cr- ***Gd*** -Fe- ***Ni*** -system)

IT Gadolinium compounds

(with iron (Fe9Gd), in Cr- ***Gd*** -Fe- ***Ni*** system)

IT ***Gadolinium*** compounds

(with ***nickel*** (GdNi), in Cr- ***Gd*** -Fe- ***Ni*** system)

IT ***Gadolinium*** compounds

(with ***nickel*** (GdNi3), in Cr- ***Gd*** -Fe- ***Ni*** system)

IT ***Gadolinium*** compounds

(with ***nickel*** (Gd2Ni7), in Cr- ***Gd*** -Fe- ***Ni*** system)

IT ***Gadolinium*** compounds

(with ***nickel*** (Gd3Ni), in Cr- ***Gd*** -Fe- ***Ni*** system)

IT 7440-02-0, ***Nickel***

(system, Cr- ***Gd*** -Fe-)

IT 7439-89-6, Iron

(system, Cr- ***Gd*** - ***Ni*** -)

IT 7440-47-3, Chromium

(system, ***Gd*** -Fe- ***Ni*** -)

L28 ANSWER 17 OF 19 HCA COPYRIGHT 2002 ACS

63:68851 Original Reference No. 63:12630c-d The production of hydrogen and helium in metals during reactor irradiation. Alter, H.; Weber, C. E. (N. Am. Aviation, Inc., Canoga Park, CA). J. Nucl. Mater., 16(1), 68-73 (English) 1965.

AB The amt. of H and He produced in reactor irradiation was calcd. for 48 elements.

IT ***7440-02-0*** , Nickel ***7440-54-2*** , Gadolinium (neutron capture by, He and H from)

RN 7440-02-0 HCA

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-54-2 HCA

CN Gadolinium (8CI, 9CI) (CA INDEX NAME)

Gd

CC 13 (Nuclear Technology)

IT ***Neutrons***

(***absorption*** or capture of, in metals, He and H from)

IT 7429-90-5, Aluminum 7429-91-6, Dysprosium 7439-89-6, Iron
7439-96-5, Manganese 7439-98-7, Molybdenum 7440-00-8, Neodymium
7440-02-0 , Nickel 7440-03-1, Niobium 7440-39-3, Barium
7440-41-7, Beryllium 7440-43-9, Cadmium 7440-44-0, Carbon
7440-45-1, Cerium 7440-47-3, Chromium 7440-48-4, Cobalt
7440-52-0, Erbium ***7440-54-2*** , Gadolinium 7440-58-6,
Hafnium 7440-60-0, Holmium 7440-69-9, Bismuth 7440-70-2,
Calcium 13981-68-5, Magnesium, isotope of mass 26 13982-02-0,
Europium, isotope of mass 153 13982-05-3, Lithium, isotope of mass
7 14258-72-1, Lithium, isotope of mass 6 14280-39-8, Magnesium,
isotope of mass 24 14304-84-8, Magnesium, isotope of mass 25
14378-48-4, Europium, isotope of mass 151 14391-25-4, Lutetium,
isotope of mass 175 14452-47-2, Lutetium, isotope of mass 176
14762-74-4, Carbon, isotope of mass 13
(neutron capture by, He and H from)

L28 ANSWER 18 OF 19 HCA COPYRIGHT 2002 ACS

63:37705 Original Reference No. 63:6690c-f Oxidation-resistant nickel-base alloys for ***neutron*** ***absorption*** . Calkins, Vincent P.; Funston, Earl S.; McGurty, James A. (U.S. Atomic Energy Commission). US 3189445 19650615, 2 pp. (Unavailable). APPLICATION: US 19561231.

AB Ni-base alloys useful for control rods in neutron reactors contain 5-25% Sm, Eu, or Gd, such alloys not being subject to the excessive localized heating, when neutrons are captured, that is produced in B control rods. The alloys were made by arc melting several times with a W electrode under He. With up to 10% Sm the bottoms were workable at 2200.degree.F., and with up to 10% Gd at 2050.degree.F. The Rockwell A hardness with 5% Sm was 54-55; with 10% Sm 61-62; with 5% Gd 59; and with 15% Gd 66. The oxide penetration after 100 hrs. at 2200.degree.F. was 0.05 in. for the Sm alloys, and 0.01 in. for the Gd alloys. The Eu alloys resembled those with Sm. U.S.

3,189,446 (Cl. 75-171); 2 pp. Alloys contg. 1/4 as much Cr as Ni, but otherwise similar, were similarly made and studied. The hot workability was the same as without Cr, and the hardness of the alloys contg. Sm was not changed by Cr. The oxide penetration after 100 hrs. at 2200.degree.F. was 0.015 in. for the Sm alloys, and 0.007 in. for the Gd alloys. The Ni-Cr phase grains in the 5% Gd alloy were surrounded by intergranular Ni5Gd. With 25% Gd practically all the structure was Ni5Gd and the alloy was too brittle for hardness testing. The Eu alloys resembled those with Sm. Preferred alloys for ***neutron*** ***absorption*** in reactor control rods are those contg. 5-10% Sm or Gd, about 20% Cr, and balance Ni.

NCL

075170000

CC

20 (Nonferrous Metals and Alloys)

IT

Europium alloys, chromium-Ni-

Europium alloys, nickel-

Gadolinium alloys, chromium- ***Ni*** -

Gadolinium alloys, ***nickel*** -

(for ***neutron*** ***absorption*** control rods,
oxidn.-resistant)

IT

Chromium alloys, ***Gd*** - ***Ni*** -

Chromium alloys, Ni-Sm-

Chromium alloys, europium-Ni-

Nickel alloy, Cr- ***Gd*** -

Nickel alloy, Cr-Sm-

Nickel alloy, ***Gd*** -

Nickel alloy, Sm-

Nickel alloy, chromium-Eu-

Nickel alloy, europium-

(for ***neutron*** - ***absorption*** control rods,
oxidn.-resistant)

IT

Nickel compounds, with ***gadolinium*** (GdNi5)
(in Cr- ***Gd*** - ***Ni*** alloys)

IT

Gadolinium compounds
(with ***nickel*** (GdNi5), in Cr- ***Gd*** - ***Ni***
alloys)

L28 ANSWER 19 OF 19 HCA COPYRIGHT 2002 ACS

61:2707 Original Reference No. 61:391b-d Gadolinium alloys of iron, chromium, nickel, and stainless steel. Copeland, M.; Kato, H. (U.S. Bur. of Mines, Albany, OR). Proc. Conf. Rare Earth Res., 2nd, Glenwood Springs, Colo., Volume Date 1961 133-41 (Unavailable) 1962.

AB

Gd is a rare earth metal with a high thermal- ***neutron***

absorption cross section that has been considered as a poison material for controlling nuclear power reactors. It is very reactive and must be protected from corrosive environment or be made corrosion resistant by alloying with other metals. These data concern phase diagrams of the systems Fe- ***Gd***, Cr- ***Gd***, ***Ni*** - ***Gd***, and stainless steel (Type 304). All these alloys have properties that may preclude their application in certain power-producing reactors. The corrosion resistance is expected to be poor except for stainless steels with low Gd contents. The stainless steel Gd alloys with .1toeq.15% Gd have good resistance to corrosion in 680.degree.F. water and 750.degree.F. steam. No formal corrosion resistance tests were run on the other alloys, but their reaction to metallographic etchants indicated poor corrosion resistance. Elemental Gd, which has poor corrosion resistance, was present in all the Cr-Gd alloys. The stainless steel-Gd alloys would be limited in high-temp. environments because of the low m.ps. of minor phases.

CC 20 (Nonferrous Metals and Alloys)
IT Chromium alloys, gadolinium-
Gadolinium alloys, chromium-, Fe-
 Gadolinium alloys, chromium-, ***Ni*** -
Iron alloys, gadolinium-
 Nickel alloy, ***gadolinium*** -
 (corrosion of)
IT 7439-89-6, Iron 7440-02-0, ***Nickel*** 7440-47-3, Chromium
 (system, ***Gd*** -)

=> d his 129-

(FILE 'HCA' ENTERED AT 15:39:14 ON 16 OCT 2002)

L29 64 S NIGD OR GDNI

L30 2 S L29 AND (L4 OR L5 OR L24)

=> d 130 1-2 cbib abs hitstr hitind

L30 ANSWER 1 OF 2 HCA COPYRIGHT 2002 ACS

75:134204 Intermetallic compounds of rare-earth elements and nickel, cobalt or iron. Buschow, K. H. J. (Philips Res. Lab., N. V. Philips' Gloeilampenfabr., Eindhoven, Neth.). Phys. Status Solidi A, 7(1), 199-210 (English) 1971. CODEN: PSSABA.

AB A survey is given of the compn. and crystal structure of existing rare earth transition intermetallics. The relation in crystal structure of the compds. RM₂, RM₃, R₂M₇, RM₅, and R₂M₁₇ is briefly discussed (R and M represent a rare earth and 3d element, resp.). The variation of the magnetic moment of the M atoms and the variation of the Curie temp. brought about by the increase of the molar fraction of the rare earth element in the various compds. is different for M being Ni, Co, or Fe. An attempt was made to explain these differences by the Friedel model of d bands in transition metals. The R-M spin interaction is antiferromagnetic and leads in general to compensation points in the magnetization vs. temp. curves. These compensation points should vary with R as g (g-1) J (J + 1). This relation is obeyed for the compds. RF₃ for which magnetic data and the lattice consts. are given. A mechanism for the R-M exchange interaction is proposed. Magnetic data are also given for the compds. GdGa and GdGa_{0.7}Cu_{0.3}, isostructural with ***GdNi***.

CC ***70*** (Crystallization and Crystal Structure)

L30 ANSWER 2 OF 2 HCA COPYRIGHT 2002 ACS

63:69598 Original Reference No. 63:12750h,12751a-b Stainless steel-gadolinium alloys. Copeland, M.; Barstow, W.; Armantrout, C.; Kato, H. (U.S. Bur. of Mines, Albany, OR). U.S. Bur. Mines, Rept. Invest., No. 6636(7), 29 pp. (English) 1965.

AB Gd may be a potential ***neutron*** ***absorber*** for controlling powerproducing reactors because of its high thermal neutron capture cross section of 46,000 barnes. Pure Gd is reactive and must be clad to protect it from corrosion or alloyed to make it corrosion resistant. Phase relations were detd. for Gd alloyed up to 40 wt. % with 304-type stainless steel. Body-centered-cubic (b.c.c) and face-centered-cubic (f.c.c.) Fe-rich solid soln. phases and several intermetallic Gd-contg. compds. of variable compn. approximating the formulas Fe₉Gd, Ni₇Gd₂, Ni₃Gd, Fe₂Gd, ***NiGd***, and NiGd₃ were identified. Fe₉Gd and Ni₇Gd₂ melted at 1080.degree. at .apprx.0.-2 wt. % Gd. The m.p. of Fe₉Gd increased with increasing Gd content to a plateau at .apprx.1230.degree. and 30 wt. % Gd, and the m.p. of Ni₇Gd₂ decreased to a plateau at 900.degree. and 30 wt. % Gd, where Ni₃Gd, ***NiGd***, and Fe₂Gd coexist. B.c.c. Fe solid soln. was stable from 1 to 2 wt. % Gd to higher contents, 30 wt. % Gd or more, and f.c.c. Fe up to 12 wt. % Gd below 1200.degree.. The stability of these phases above 1200.degree. was not resolved, except for the m.ps. Fabrication variables and mech. and corrosion properties of alloys contg. up to 5 wt. % Gd were studied. Equilibrating and forming operations were done best at 940-1080.degree.. Some variability in the yield and tensile strengths of alloys was noted. There was a continual decrease in ductility and impact resistance with increasing Gd contents. The

resistance of the alloys to corrosion in water at 354.degree. was
about the same as stainless steel.

CC 19 (Ferrous Metals and Alloys)

IT Iron, with gadolinium (Fe2Gd)

Iron, with gadolinium (Fe9Gd)

Nickel compounds, with gadolinium (***GdNi***)

Nickel compounds, with gadolinium (GdNi3)

Nickel compounds, with gadolinium (Gd2Ni7)

Nickel compounds, with gadolinium (Gd3Ni)

(in Cr-Gd-Fe-Ni system)

IT Gadolinium compounds

(with nickel (***GdNi***), in Cr-Gd-Fe-Ni system)

=> d his 131-

(FILE 'HCA' ENTERED AT 15:39:14 ON 16 OCT 2002)

FILE 'STNGUIDE' ENTERED AT 16:39:12 ON 16 OCT 2002

FILE 'METADEX' ENTERED AT 16:40:08 ON 16 OCT 2002

L31 137 S GD*NI/ET
L32 3063 S GD/ET
L33 67415 S NI/ET
L34 4011 S L5
L35 0 S L34 AND L31
L36 2 S L34 AND L32 AND L33

=> d 136 1-2 all

L36 ANSWER 1 OF 2 METADEX COPYRIGHT 2002 CSA

AN 1992(12):23-861 METADEX

TI Determination of Trace Metals in Uranium Oxide by Inductively Coupled Plasma Mass Spectrometry Combined With On-Line Solvent Extraction.

AU Vijayalakshmi, S. (Indira Gandhi Centre for Atomic Research); Prabhu, R.K. (Indira Gandhi Centre for Atomic Research); Mahalingam, T.R. (Indira Gandhi Centre for Atomic Research); Mathews, C.K. (Indira Gandhi Centre for Atomic Research)

SO Journal of Analytical Atomic Spectrometry (Apr. 1992) 7, (3), 565-569, Spectra, 14 ref.

ISSN: 0267-9477

DT Journal

CY United Kingdom

LA English

AB An on-line solvent extraction technique for the determination of trace elements in uranium by inductively coupled plasma mass spectrometry is described. An aqueous solution containing U (2% m/v) in 1 mol dm⁻³ nitric acid and an organic solvent that can effectively extract U, trioctylphosphine oxide in cyclohexane (0.2 mol dm⁻³), are pumped alternately through a poly(tetrafluoroethylene) (PTFE) tube where they mix thoroughly. The organic phase containing the extracted U is removed on-line by allowing the solution to pass through a microporous PTFE tube which, being hydrophobic, selectively allows the organic phase to permeate through its walls. This technique facilitates rapid and sensitive determination of trace elements in uranium with detection levels in the range 1-45 ppb for La, Ce, Pr, Nd, Sm, Eu, Gd, Dy, Ho, Er, Yb, Ag, Ba, Cd, cobalt, Cr, Cu, indium, Li, Mn, Ni, Pb, Sr, Ti, vanadium and yttrium, 0.1 ppm for Al and 0.5 ppm for Fe.

CC 23 Analysis

CT Journal Article; Uranium: Chemical analysis; Uranium oxides: Chemical analysis; Trace elements: Chemical analysis; Nuclear fuels: Chemical analysis; Mass spectroscopy; Inductively coupled plasma; Solvent extraction

ET U; La; Ce; Pr; Nd; Sm; Eu; Gd; Dy; Ho; Er; Yb; Ag; Ba; Cd; Cr; Cu; Li; Mn; Ni; Pb; Sr; Ti; Al; Fe

L36 ANSWER 2 OF 2 METADEX COPYRIGHT 2002 CSA

AN 1989(5):23-302 METADEX

TI Trace Metal Characterization of the U-Al Matrix by Atomic Spectroscopy.

AU Argekar, A.A.; Thulasidas, S.K.; Kulkarni, M.J.

CS Bhabha Atomic Research Centre

SO Nucl. Technol. (Feb. 1989) 84, (2), 196-204
ISSN: 0029-5450
DT Journal
LA English
AB U-Al alloys with a significant enrichment of uranium with 233U or 235U serve as nuclear fuels in research reactors. The quality assurance of this fuel requires, among other things, precise knowledge that all trace metal constituents that affect neutron economy, fuel integrity, and fuel fabrication process parameters are well within the specification limits. Trace metal characterization of 233U-Al alloy has been carried out by atomic spectrometry. The trace metal constituents of interest are grouped into common metals (Ag, boron, Ca, Cd, cobalt, Cr, Cu, Fe, magnesium, Mn, Mo, Na, Ni, Pb, Si, Sn, Ti, vanadium, tungsten, and Zn) and lanthanides (Ce, Dy, Eu, Gd, Ho, Lu, Sm, and Tb). The elements yttrium and Zr are grouped with the latter in view of the chemical separation procedure used. The alloy samples are dissolved in 6M HCl and evaporated to dryness with nitric acid, and the residue is ignited to oxide. The common metals other than Ag are determined in the oxide samples using carrier excitation of the analyte spectra obtained using a computer-controlled multichannel direct reading spectrometer. Electrothermal atomization atomic absorption spectrometry is used for determining Ag, using the nitric acid solution of the alloy. The rare earth elements Y and Zr are determined after separation from the U-Al matrix, using a sequence of chemical procedures. In the first stage, U is separated by solvent extraction using a TnOA/xylene/HCl system and, in the second stage, Al is separated as sodium-aluminate. The trace elements are determined by a dc arc emission spectrographic method after chemical separation. Of these, Dy, Eu, Gd, and Sm are determined by inductively coupled plasma-atomic emission spectrometry also. These methods are found to be quite adequate for the requirements of U-Al alloy fuel samples. Typical detection limits of these analytes varied in the 0.01-1.25 μ g range. The precision varied in the 10-35% range. The waste generated in these processes has been treated for quantitative recovery of 233U. 19 ref.-AA
CC 23 ANALYSIS
CT Uranium base alloys: Chemical analysis; Nuclear fuels: Chemical analysis; Trace elements: Chemical analysis; Spectrochemical analysis
ET Al*U; Al sy 2; sy 2; U sy 2; U-Al; U; 233U; is; U is; 235U; 233U-Al; Ag; Ca; Cd; Cr; Cu; Fe; Mn; Mo; Na; Ni; Pb; Si; Sn; Ti; Zn; Ce; Dy; Eu; Gd; Ho; Lu; Sm; Tb; Zr; Cl*H; HCl; H cp; cp; Cl cp; Y; Al

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?ds

Set	Items	Description
S1	17447	NEUTRON? (2N) (ABSORB? OR ABSORP? OR ADSORB? OR ADSORP? OR S- ORB? OR SORP? OR CHEMICOSORB? OR CHEMICOSORP? OR CHEMISORB? OR CHEMISORP?)
S2	1299	(NICKEL? ? OR NI) (2N) (GADOLINIUM? ? OR GD)
S3	1686079	CANNISTER? OR CONTAINER? OR VESSEL? OR RECEPTACL? OR DRUM - OR DRUMS OR BARREL?
S4	1823	ATOMIC? (2N) (STORE? ? OR STORING? ? OR STORAG? OR SHIELD? OR CLAD? OR CASING? ? OR ENCAS? OR ENCLOS? OR ENVELOP? OR HOUSI- NG? ? OR SHROUD? OR JACKET? OR ENWRAP? OR WRAP? OR GUARD? OR - SCREEN? OR ENCAPSUL? OR CAPSUL?)
S5	21711	NUCLEAR? (2N) (STORE? ? OR STORING? ? OR STORAG? OR SHIELD? - OR CLAD? OR CASING? ? OR ENCAS? OR ENCLOS? OR ENVELOP? OR HOU- SING? ? OR SHROUD? OR JACKET? OR ENWRAP? OR WRAP? OR GUARD? OR SCREEN? OR ENCAPSUL? OR CAPSUL?)
S6	40661	RADIOACTIV? (2N) (STORE? ? OR STORING? ? OR STORAG? OR SHIEL- D? OR CLAD? OR CASING? ? OR ENCAS? OR ENCLOS? OR ENVELOP? OR - HOUSING? ? OR SHROUD? OR JACKET? OR ENWRAP? OR WRAP? OR GUARD? OR SCREEN? OR ENCAPSUL? OR CAPSUL?)
S7	7	S2 AND S1
S8	1	S2 AND (S4 OR S5 OR S6)
S9	5	S2 AND S3
S10	11	S7 OR S8 OR S9
S11	9	RD S10 (unique items)

?t s11/7,de/all

11/7,DE/1 (Item 1 from file: 2)

DIALOG(R)File 2:INSPEC
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5708112 INSPEC Abstract Number: A9721-7680-006
Title: ^{161}Dy and ^{155}Gd Mossbauer spectroscopy of the RTC/₂ intermetallics (R=Dy, Gd; T=Ni, Co)
Author(s): Onodera, H.; Amanai, H.; Matsuo, S.; Kosaka, M.; Kobayashi, H.; Ohashi, M.; Yamaguchi, Y.
Author Affiliation: Inst. for Mater. Res., Tohoku Univ., Sendai, Japan
Journal: Science Reports of the Research Institutes, Tohoku University,

Publisher: Tohoku Univ,

Publication Date: March 1997 Country of Publication: Japan

CODEN: SRTAA6 ISSN: 0040-8808

SICI: 0040-8808(199703)45:1L.1:11MS;1-I

Material Identity Number: S027-97005

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: ^{161}Dy and ^{155}Gd Mossbauer spectroscopic studies on DyCoC_{2} , DyNiC_{2} , GdCoC_{2} and GdNiC_{2} which were performed in order to obtain microscopic information on magnetic properties are reviewed. The experiments were done using the standard ^{161}Tb and ^{155}Eu Mossbauer sources prepared by neutron irradiation at the Japan Material Testing Reactor. Simple ferromagnetic DyCoC_{2} is a good object to compare the magnetic hyperfine field with the magnetic moment determined precisely by the magnetization measurement of the single crystalline sample. DyNiC_{2} is an antiferromagnet with commensurate magnetic structure and incommensurate moment-modulation structure. The magnetic hyperfine field changes correspondingly well with both magnetic structures. It is shown that ^{155}Gd Mossbauer spectroscopy is very useful to determine the moment direction in the Gd compounds which are rarely investigated by neutron diffraction because of large neutron absorption cross section of the natural Gd nuclei. The crystalline electric field parameter A_{20} determined from the quadrupole interaction acting on Gd is also useful to interpret the magnetic anisotropy of the other rare earth atoms in the isostructural compounds. (27 Refs)

Subfile: A

Descriptors: antiferromagnetic materials; cobalt alloys; crystal field interactions; dysprosium alloys; ferromagnetic materials; gadolinium alloys; hyperfine interactions; magnetic anisotropy; magnetic moments; magnetic structure; magnetisation; Mossbauer effect; nickel alloys; quadrupole interactions

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11/7,DE/2 (Item 2 from file: 2)

DIALOG(R)File 2:INSPEC

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01923405 INSPEC Abstract Number: A82096062

Title: Neutron-optical properties of multilayer systems with absorption

Author(s): Ebisawa, T.; Akiyoshi, T.; Achiwa, N.; Yamada, S.; Okamoto, S.

Author Affiliation: Res. Reactor Inst., Kyoto Univ., Osaka, Japan

Journal: Annual Reports of the Research Reactor Institute, Kyoto University vol.14 p.10-18

Publication Date: 1981 Country of Publication: Japan

CODEN: KURA9V ISSN: 0454-9244

Language: English Document Type: Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: Neutron optical properties of multilayer systems with absorption are studied by a conventional neutron optical calculation including complex refractive index. The reflectivities of films containing Gd are calculated and a homogeneous Gd-Ti-Ni film is proposed as an excellent anti-reflection film. The optical enhancement of neutron absorption due to thin layer interference is demonstrated by calculations of the reflectivities of optical systems with an absorbing film deposited on a total reflecting film. It is found that the reduction of the reflectivity of Ni-Ti supermirror of 25000 Å in total thickness could be suppressed to only several percent when the preferable order of layer thickness distribution is chosen. (8 Refs)

Subfile: A

Descriptors: neutron transport theory; particle beam diagnostics; particle optics

11/7,DE/3 (Item 1 from file: 8)

DIALOG(R)File 8:EI Compendex(R)

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06160660

E.I. No: EIP02417137720

Title: Development of nickel-chromium-molybdenum-gadolinium alloys for controlling nuclear criticality

Author: Baratta, Anthony; Bartlett, John W.; Brodsky, Robert; Brolin, Edson C.; Hendrickson, Tom A.; Hurt, Nathan H.; Jordan, Robert P.; Patti, Francis J.; Rosenberg, Richard

Source: Center for Research and Technology Development, (Publication) CRTD, American Society of Mechanical Engineers v 64 2002. p 565-569

Publication Year: 2002

CODEN: CRTDED

Language: English

Document Type: JA; (Journal Article) Treatment: G; (General Review)

Journal Announcement: 0210W2

Abstract: The proposal for the investigation of the corrosion resistance of a new class of alloys in which the neutron-absorbing element gadolinium is alloyed into nickel-based alloys is reviewed. The main observation is that the design of the project appears to be consistent with ASTM standard methods for determining corrosion resistance of metals, and ASME Boiler and Pressure Vessel Code requirements for mechanical properties and weldability of metals. In view of this, it is recommended that the submission be considered for support. (Edited abstract)

Descriptors: *Nickel alloys; Criticality (nuclear fission); Spent fuels; Neutron absorption; Radioactive waste storage; Corrosion; Sodium chloride; Electrochemistry; Metallographic microstructure; Gravimetric analysis; Chemical analysis; Microscopic examination; Absorption spectroscopy

11/7,DE/4 (Item 1 from file: 109)

DIALOG(R)File 109:Nuclear Sci. Abs.

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187731 NSA-16-011775

SUMMARY TECHNICAL REPORT ON FEED MATERIALS FOR THE PERIOD APRIL 1, 1959 TO JUNE 30, 1959

Simmons, J.W. ed.

National Lead Co. of Ohio, Cincinnati

Publication Date: July 20, 1959 83 p.

Primary Report No.: NLCO-790

Journal Announcement: NSA16

Document Type: Report

Language: English

Contract No.: AT(30-1)-1156

Anaconda Acld, Kermac, Moab, Rifle, and Texas Zinc uranium concentrates were evaluated (the laboratory portion of feed material evaluation).

Laboratory equilibrium tests and Pilot Plant 2-inch-column extraction tests demonstrated effective distribution of uranium into a TBP/kerosene solvent from aqueous phases containing as little as 0.5N HNO₃ and varying amounts of added metal nitrates (NaNO₃). The concentration of associated nitric acid in dilute aqueous nitric acid solutions was determined after values were obtained for the equilibrium constant for the

reaction of tri-n-butyl phosphate with associated nitric acid and for the equilibrium distribution constant for the partition of associated nitric acid into tri-n-butyl phosphate. Optimum partition of uranium into tri-n-butyl phosphate was realized in the laboratory by using an aqueous uranyl nitrate solution containing sufficient hydrogen ions to promote extraction and a low concentration of associated nitric acid. An Ohmart system for controlling the uranium profile in the "A" extraction column was installed on Refinery pulse columns. Use of this system improved control but did not stop all column upsets. The effect of 13 to 189 ppm sodium contamination upon hydrofluorination conversion of teraperature at the site of the reaction. Uranyl sulfate was shown to undergo an enantiotropic transition at 755 deg C and to decompose to U₃O₈ in an atmosphere of oxygen sulfur dioxide, which gases are evolved during decompositon. Decontamination of sodium, calcium, nickel, magnesium, gadolinium, and dysprosium was achieved in a laboratory investigation of the ADU process. UO₂ produced by reductions programmed from 700 to 1100 deg F was hydrofluorinated at programmed temperatures of 550 to 1100 deg F and isothermally at 1100 deg F. Good conversion was obtained for material whose source was ADU calcined at 1200 deg F. Uranium derbles were classified by the present method of derby grading and were then examined for slag coverage, slag volume, and slag weight. There was a high degree of overlap of these parameters for adjacent grades. A hydraulic separator for separating uranium from magnesium and magnesium fluoride was fabricated. Excellent separation was obtained for +16 mesh material. A hydrochloric acid dissolution-UF₄ precipitation process for routing scrap materials to the reduction-to-metal step was examined. The purification obtained was noted, and process conditions were varied to determine their effect upon UF₄ density, UF₄ purity and precipitation time. Three types of uranium scrap were subjected to the HCl dissolution-aqueous precipitation Winlo process to determine the purification achieved. Green salt made from dolomitic bomb liner residues was found to be grossly contaminated. Acceptable green salt was made from pickle liquor treated with formaldehyde and from pickle liquor plus black oxide. Nominal 80% yields were obtained in the recovery of magnesium metal by reaction of calcium carbide with magnesium fluoride slag and in the recovery of HF by the reaction of sulfuric acid with magnesium fluoride slag. A sample holder for use in quantitative preferred orientation studies was fabricated. The holder, designed to fit a North American Philips Gonionweter, will accommodate specimens up to 1 13/16 inches in diameter and incorporates a precision ball bearing. A satisfactory technique was developed for the analysis of uranium metal for traces of fluoride. A direct flame photometric method is given for the determination of magnesium in uranium ore concentrates. No chemical separation step is required, except for high-iron-content ores. (auth)

Descriptors: ACIDITY BUTYL PHOSPHATES CHEMICAL REACTIONS COLORADO COMPLEXES CONCENTRATION CONTROL DISTRIBUTION ENRICHMENT EXTRACTION COLUMNS KEROSENE NEW MEXICO NITRIC ACID ORE PROCESSING ORES PARTITION PETROLEUM PILOT PLANT PULSE COLUMNS PULSES QUANTITATIVE ANALYSIS QUANTITY RATIO SEPARATION PROCESSES SODIUM NITRATES SOLVENT EXTRACTION SOLVENTS TBP TESTING URANIUM COMPOUNDS URANIUM CONCENTRATES URANIUM ORES URANYL NITRATES UTAH WATER ZINC; CHEMICAL REACTIONS FLUORIDES FLUORINATION HYDROFLUORIC ACID IMPURITIES SODIUM COMPOUNDS TEMPERATURE TRACE AMOUNTS URANIUM DIOXIDE; ALLOTROPY DECOMPOSITION HIGH TEMPERATURE OXYGEN PYROLYSIS RECRYSTALLIZATION SULFATES SULFUR OXIDES TRANSIENTS URANYL COMPOUNDS U₃O₈; ADU CALCINATION CALCIUM COMPOUNDS CHEMICAL REACTIONS DECONTAMINATION DYSPROSIVUM COMPOUNDS FLUORINATION GADOLINIUM COMPOUNDS HIGH TEMPERATURE HYDROFLUORIC ACID IMPURITIES MAGNESIUM COMPOUNDS NICKEL COMPOUNDS PRODUCTION PYROLYSIS REDUCTION SEPARATION PROCESSES SLAGS SODIUM COMPOUNDS TEMPERATURE TESTING URANIUM URANIUM DIOXIDE VOLUME WEIGHT; CYCLONE SEPARATORS EFFICIENCY FABRICATION GRAIN SIZE HYDRAULICS MAGNESIUM MAGNESIUM FLUORIDES SEPARATION

PROCESSES URANIUM; ALDEHYDES CALCIUM COMPOUNDS DENSITY DOLOMITE FORMIC ACID HYDROFLUORIC ACID IMPURITIES LEACHING MAGNESIUM CARBONATES PRECIPITATION PRESSURE VESSELS QUANTITATIVE ANALYSIS REDUCTION RESIDUES SOLUTIONS TESTING URANIUM URANIUM COMPOUNDS URANIUM TETRAFLUORIDE U₃O₈ VELOCITY WASTE PROCESSING WATER WINLO PROCESS; CALCIUM CARBIDES CHEMICAL REACTIONS EFFICIENCY HYDROFLUORIC ACID LOSSES MAGNESIUM MAGNESIUM FLUORIDES RECOVERY SLAGS SULFURIC ACID; BEARINGS CONFIGURATION GONIOMETERS INSTRUMENTS LABORATORY EQUIPMENT SAMPLING VESSELS; FLUORIDES QUALITATIVE ANALYSIS TRACE AMOUNTS URANIUM; CHEMICAL REACTIONS COMBUSTION IRON COMPOUNDS MAGNESIUM COMPOUNDS ORE PROCESSING PHOTOMETRY QUALITATIVE ANALYSIS QUANTITATIVE ANALYSIS SEPARATION PROCESSES URANIUM ORES

11/7,DE/5 (Item 2 from file: 109)

DIALOG(R) File 109:Nuclear Sci. Abs.

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142357 NSA-14-025913

IMPROVEMENTS RELATING TO NEUTRON-ABSORBING BODIES FOR USE IN NUCLEAR REACTORS

Worn, D.K.; Bradbury, E.J.

Patent No.: GB 838442 Assignee: Mond Nickel Co., Ltd.

Publication Date: June 22, 1960 v p.

Journal Announcement: NSA14

Document Type: Patent

Language: English

Fuclile reactor control rods can be made from a discrete phase of neutron-absorbing material dispersed in a matrix if the phase is made coarse enough to be retained on a 200-mesh B.S.S. screen, but fine enough to pass through a 60-mesh B.S.S. screen. Suitable phase-matrix combinations that are stable up to 900 deg C are boron carbide and copper, gadolinium oxide and nickel or iron, and europium oxide and nickel or iron. The shaped sintered bodies may be covered by stainless steel or other corrosion-resistant alloys. (D. L.C.)

Descriptors: ABSORPTION; BORON CARBIDES; COATING; CONTROL ELEMENTS; COPPER; CORROSION PROTECTION; DISPERSIONS; EUROPIUM OXIDES; GADOLINIUM OXIDES; GRAIN SIZE; IRON; NEUTRONS; NICKEL; PATENT; REACTORS; RODS; SINTERED MATERIALS; STABILITY; STAINLESS STEELS; TEMPERATURE; USES

11/7,DE/6 (Item 1 from file: 350)

DIALOG(R) File 350:Derwent WPIX

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014670032

WPI Acc No: 2002-490736/200252

Mixed oxide, used as photocatalyst, is synthesized using synthesis robot directly in suitable reaction vessels and tested by radiation with visible or UV light for photocatalytic degradation of organic compounds

Patent Assignee: STUDIENGESELLSCHAFT KOHLE MBH (STUD)

Inventor: KISCH H; LETTMANN C; MAIER W F

Number of Countries: 022 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200251546	A1	20020704	WO 2001EP14012	A	20011130	200252 B

Priority Applications (No Type Date): DE 1064317 A 20001222

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200251546	A1	G	29	B01J-035/00	

Designated States (National): CA JP US

Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LU
MC NL PT SE TR

Abstract (Basic): WO 200251546 A1

Abstract (Basic):

NOVELTY - Mixed oxide contains up to 99 mol.% of one or more oxides of Sn, W, V, Ga, In, Cd, Zn, Nb, Pb, Co, Cr, Fe, Zr, Bi, Cu or Hf; and up to 50 mol.% of one or more oxides of Pt, Pd, C, Rh, Ru, Gd, Ce, Ni, Ir, Au, Ag, Nd, Pr, Ce, Re, Au, Tb, Ca, Mn, Ta, Ho, Sm, Ta or B. They are synthesized using a synthesis robot directly in suitable reaction vessels and tested by radiation with visible or UV light for photocatalytic degradation of organic compounds.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for;

(1) A process for the high throughput screening of mixed oxides containing up to 99 mol.% of one or more oxides of Sn, W, V, Ga, In, Cd, Zn, Nb, Pb, Co, Cr, Fe, Zr, Bi, Cu or Hf; and up to 50 mol.% of one or more oxides of Pt, Pd, C, Rh, Ru, Gd, Ce, Ni, Ir, Au, Ag, Nd, Pr, Ce, Re, Au, Tb, Ca, Mn, Ta, Ho, Sm, Ta or B; and

(2) A catalyst material as above.

Preferred Features: The testing process comprises adding contaminated water or air and measuring the impurity by radiating. The impurity is 4-chlorophenol. The reaction vessel are microtiter plates. Mass spectrometry or chromatography is used in the testing process.

USE - Used as a photocatalyst.

ADVANTAGE - Pollutant emissions are reduced.

pp; 29 DwgNo 0/5

Title Terms: MIX; OXIDE; PHOTOCATALYST; SYNTHESIS; SYNTHESIS; ROBOT; SUIT; REACT; VESSEL; TEST; RADIATE; VISIBLE; ULTRAVIOLET; LIGHT; PHOTOCATALYST; DEGRADE; ORGANIC; COMPOUND

Derwent Class: J04

International Patent Class (Main): B01J-035/00

International Patent Class (Additional): B01J-023/00

11/7,DE/7 (Item 2 from file: 350)

DIALOG(R) File 350:Derwent WPIX

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011317477

WPI Acc No: 1997-295381/199727

Stainless steel having good thermal neutron absorbing ability - contains manganese@, nickel@, chromium@, boron, gadolinium, aluminium@, yttrium, molybdenum@, and iron@

Patent Assignee: SUMITOMO METAL IND LTD (SUMQ)

Number of Countries: 001 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 9111414	A	19970428	JP 95272217	A	19951020	199727 B
JP 3237486	B2	20011210	JP 95272217	A	19951020	200203

Priority Applications (No Type Date): JP 95272217 A 19951020

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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JP 9111414	A	6		C22C-038/00	
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JP 3237486	B2	6		C22C-038/00	Previous Publ. patent JP 9111414
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Abstract (Basic): JP 9111414 A

The stainless steel contains, (unit: wt%), less than 0.02. C: less than 0.5 Si: 0.1-0.9 Mn: less than 0.03 P: less than 0.01 S: 7-22 Ni:

18-26 Cr: 0.9-1.8 B: 0.05-1.50 Gd: 0.005-0.10 Al: less than 0.030 N: less than 0.30 P: 3.0 Mo: Fe and unavoidable impurities: the balance. The contents of B (wt%) and Gd (wt%) satisfy condition: ((B(1-0.015B)) plus 4.4Gd) is more than 2. The Fe equivalent: Fe.eq. is between - 11 and - 5, where Fe.eq=Ni.eq - 1.4 Cr.eq + 11.6, and Ni.eq=Ni + 0.5 Mn + 30(C + N) - 3B, and Cr.eq=Cr + 1.5Si + Mo, where unit is wt%.

ADVANTAGE - The stainless steel has good heat manufacturing ability, weldability, and corrosion resistance, and large thermal neutron absorbing ability.

Dwg.1/1

Title Terms: STAINLESS; STEEL; THERMAL; NEUTRON; ABSORB; ABILITY; CONTAIN; MANGANESE; NICKEL; CHROMIUM; BORON; GADOLINIUM; ALUMINIUM; YTTRIUM; MOLYBDENUM; IRON

Derwent Class: K05; M27; X14

International Patent Class (Main): C22C-038/00

International Patent Class (Additional): C22C-038/54; G21C-007/24;

G21D-001/00

11/7,DE/8 (Item 3 from file: 350)

DIALOG(R) File 350:Derwent WPIX

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004658335

WPI Acc No: 1986-161677/198625

Coronary artery disease and atherosclerosis diagnosis and location - by detecting porphyrin detecting agent absorbed by blood vessel wall

Patent Assignee: BETH ISRAEL HOSPITAL ASSOC (BETH-N)

Inventor: SPEARS J R

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4577636	A	19860325	US 84574682	A	19840127	198625 B

Priority Applications (No Type Date): US 84574682 A 19840127; US 82443958 A 19821123

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 4577636	A		4		

Abstract (Basic): US 4577636 A

Atherosclerosis is diagnosed by injecting a porphyrin soln. into the blood vessels to be examined, detecting the quantity of porphyrin absorbed by the vessels and contrasting it in different parts of the vessels to determine the location, size and quantity of the atheromatous plaques.

Porphyrins can carry a radioactive marker which can be detected by scintillation techniques. Suitable cpds. are of formula (I), (where Me=metal). This can be labelled with e.g. 64Cu, 14C, 3H or 125I. The porphyrin may also be detected by NMR, in which case Me in formula (I) could be Mn, Fe, Gd, Cr, Co, Ni, Ag, Eu or by Position Emission Tomography in which case markers on the porphyrin would be 68Ga, 11CO, 13NH3 and "C-glucose. Further methods of detection are by X-ray contrast, in which case (I) is substd. by a contrast agent such as or by illuminating the blood vessels and detecting the fluorescence. The test may be made more specific by attaching to the porphyrin, an antibody specific to a component of the atheromatous plaques.

USE - Detection of coronary artery disease and atherosclerosis without the use of invasive (e.g. surgical) methods except when the porphyrins are detected by fluorescence.

Title Terms: CORONARY; ARTERY; DISEASE; ATHEROSCLEROSIS; DIAGNOSE; LOCATE; DETECT; PORPHYRIN; DETECT; AGENT; ABSORB; BLOOD; VESSEL; WALL

Derwent Class: B04; P31

International Patent Class (Additional): A61B-005/02; A61B-006/00

11/7,DE/9 (Item 4 from file: 350)

DIALOG(R) File 350:Derwent WPIX

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001132974

WPI Acc No: 1974-06595V/197404

Stabilising formic acid - for storage in closed vessels, by addition of salts

Patent Assignee: BP CHEM INT LTD (BRPE)

Number of Countries: 002 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
NL 7309327	A	19740108				197404 B
DE 2333599	A	19740124				197405

Priority Applications (No Type Date): GB 7231703 A 19720706

Abstract (Basic): NL 7309327 A

Formic acid (I) >=80% strength, is stabilised against decompsn. to CO and H₂O by dissolving in (I) a salt of a metal of Gp I or II with at. no is not >56, or of Zn, Cd, Mn, Fe Co, Ni or Gd with an anion which does not promote the decompsn. of I. The stabilised (I) can safety be stored in closed vessels.

Title Terms: STABILISED; FORMIC; ACID; STORAGE; CLOSE; VESSEL; ADD; SALT

Derwent Class: E17

International Patent Class (Additional): B01J-001/16; C07C-051/50; C07C-053/02

?ds s12-

Set	Items	Description
S12	629	NIGD? ? OR GDNI? ?
S13	2	S12 AND (S1 OR S4 OR S5 OR S6)
S14	1	S13 NOT S10

?t s14/7,de/1

14/7,DE/1 (Item 1 from file: 103)

DIALOG(R) File 103:Energy SciTec

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04255220 JPN-97-011067; EDB-98-012584

Title: [sup 161]Dy and [sup 155]Gd Moessbauer spectroscopy of the RTC[sub 2] intermetallics

Author(s): Onodera, Hideya; Amanai, Hidetaka; Matsuo, Satoru; Kosaka, Masashi; Ohashi, Masayoshi; Yamaguchi, Yasuo (Tohoku Univ., Sendai (Japan). Inst. for Materials Research); Kobayashi, Hisao

Source: Science Reports of the Research Institutes, Tohoku University, Series A v 45:1. Coden: SRTAA6 ISSN: 0040-8808

Publication Date: Mar 1997

p 1-10

Language: English

Abstract: [sup 161]Dy and [sup 155]Gd Moessbauer spectroscopic studies on DyCoC[sub 2], DyNiC[sub 2], GdCoC[sub 2] and GdNiC[sub 2] which were performed in order to obtain microscopic information on magnetic properties are reviewed. The experiments were done using the standard [sup 161]Tb and [sup 155]Eu Moessbauer sources prepared by neutron irradiation at the Japan Material Testing Reactor. A simple ferromagnetic DyCoC[sub 2] is a good object to compare the magnetic hyperfine field with the magnetic moment determined precisely by the magnetization measurement of the single crystalline sample. DyNiC[sub 2] is an antiferromagnet with commensurate magnetic structure and incommensurate moment-modulation structure. The magnetic hyperfine field changes correspondently well with the both magnetic structures. It is exhibited that the [sup 155]Gd Moessbauer spectroscopy is very useful to determine the moment direction in the Gd compounds which are rarely investigated by neutron diffraction because of large neutron absorption cross section of the natural Gd nuclei. The crystalline electric field parameter A[sub 2][sup 0] determined from the quadrupole interaction acting on Gd is also useful to interpret the magnetic anisotropy of the other rare earth atoms in the isostructural compounds. (author)

Descriptors: COBALT COMPOUNDS; CRYSTAL FIELD; CRYSTAL STRUCTURE; DYSPROSIUM 161; EXPERIMENTAL DATA; GADOLINIUM 155; HYPERFINE STRUCTURE; INTERMETALLIC COMPOUNDS; MOESSBAUER EFFECT; NICKEL COMPOUNDS

Broader Terms: ALLOYS; DATA; DYSPROSIUM ISOTOPES; EVEN-ODD NUCLEI; GADOLINIUM ISOTOPES; INFORMATION; INTERMEDIATE MASS NUCLEI; ISOTOPES; NUCLEI; NUMERICAL DATA; RARE EARTH NUCLEI; STABLE ISOTOPES; TRANSITION ELEMENT COMPOUNDS